

Figure 1: Screening libraries of chimeric promoter sequences

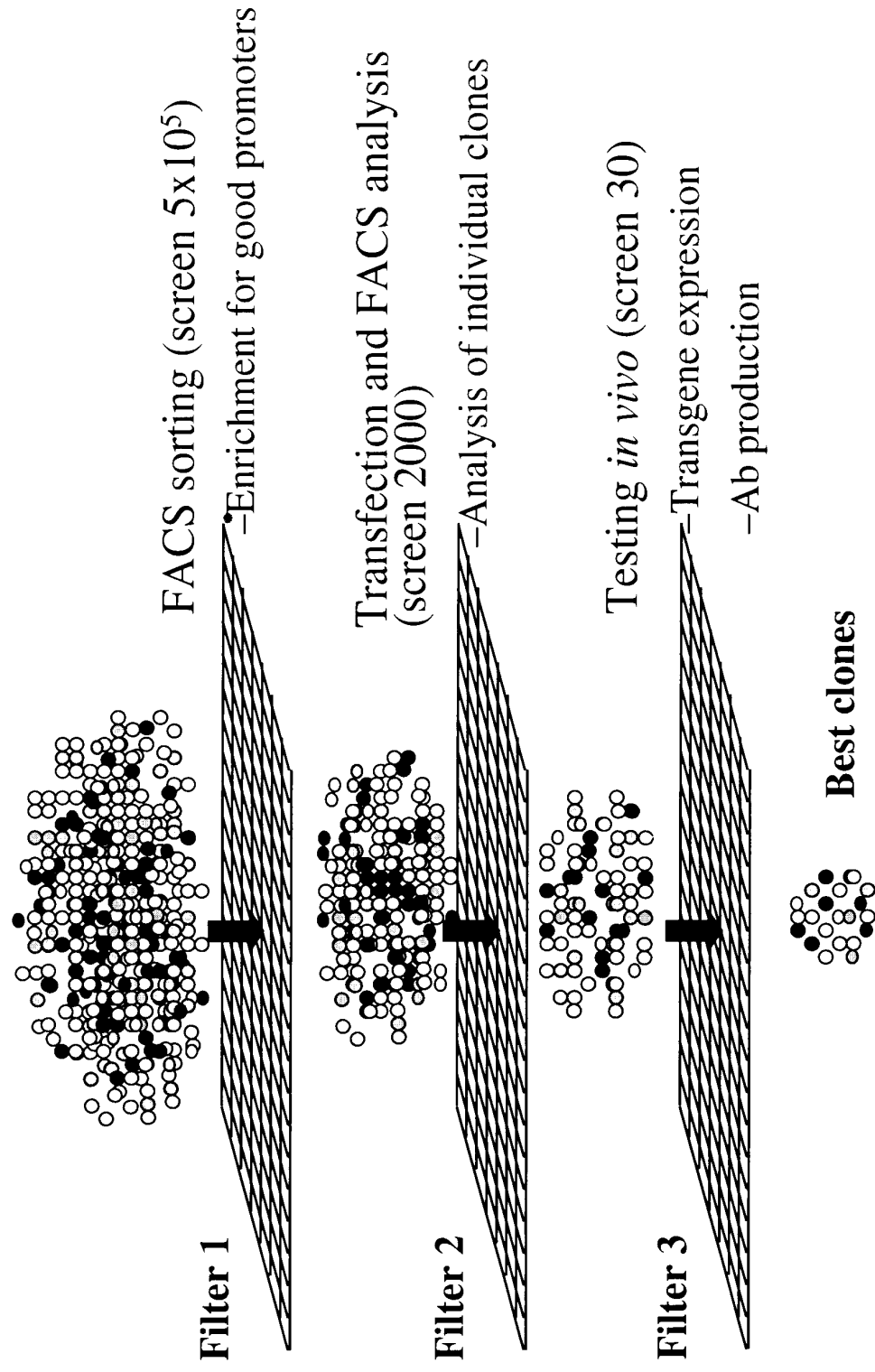


Figure 2: Enrichment of chimeric promoter libraries
by FACS sorting

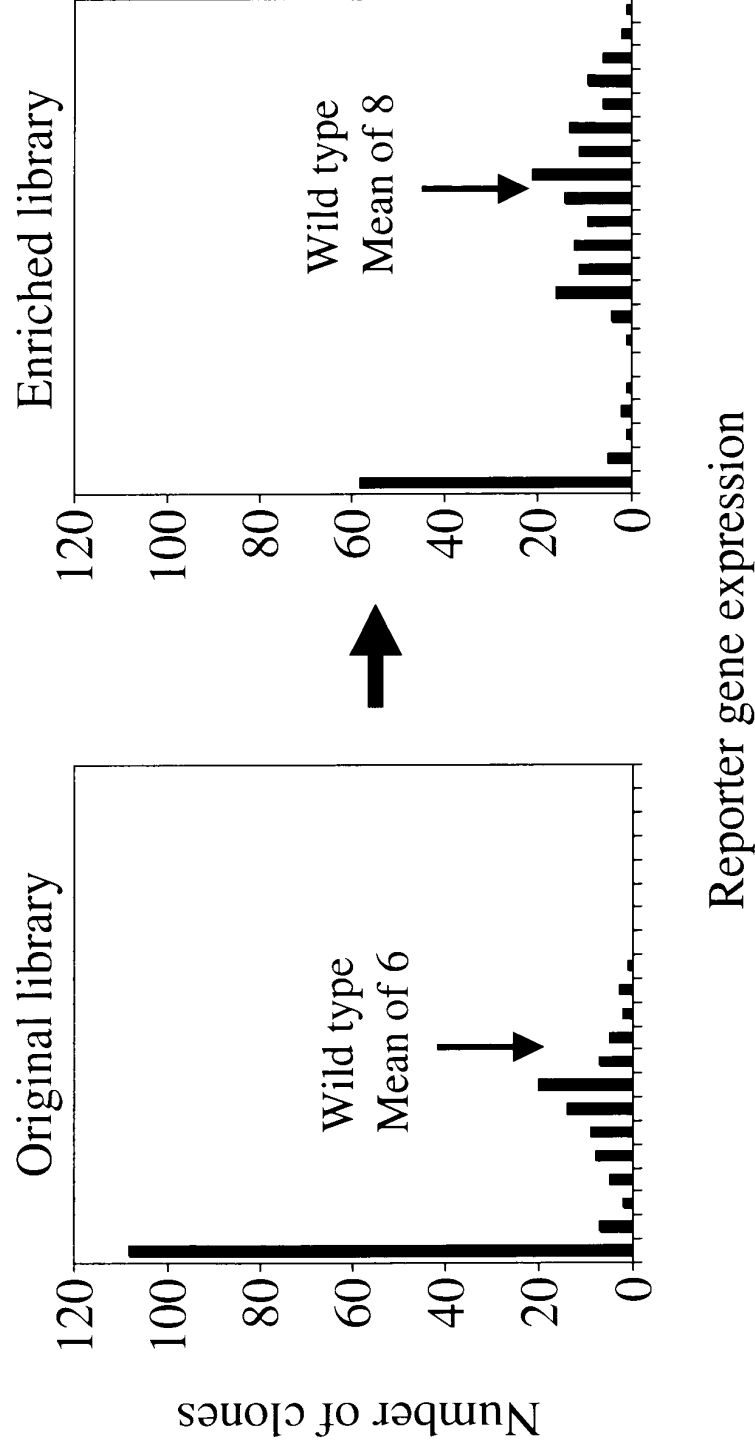
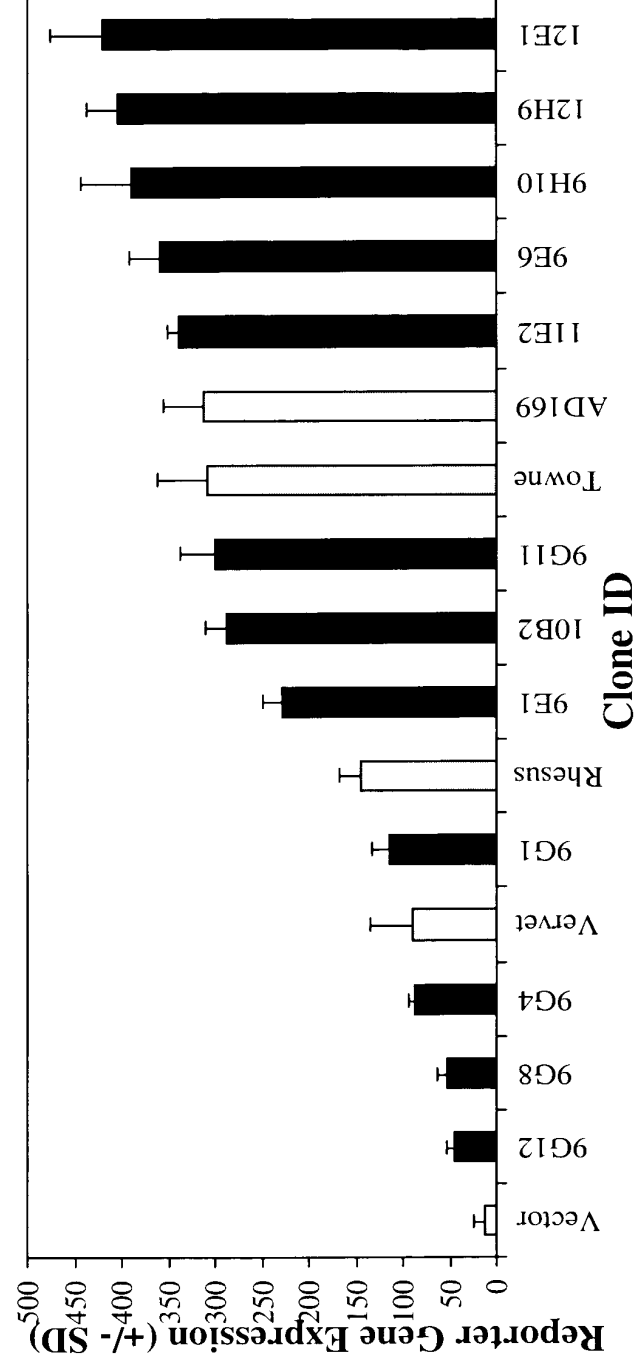


Figure 3: Diverse activities of chimeric promoter sequences in transfected cells



**Figure 4: Luciferase expression in muscle 7 days
after plasmid injection**

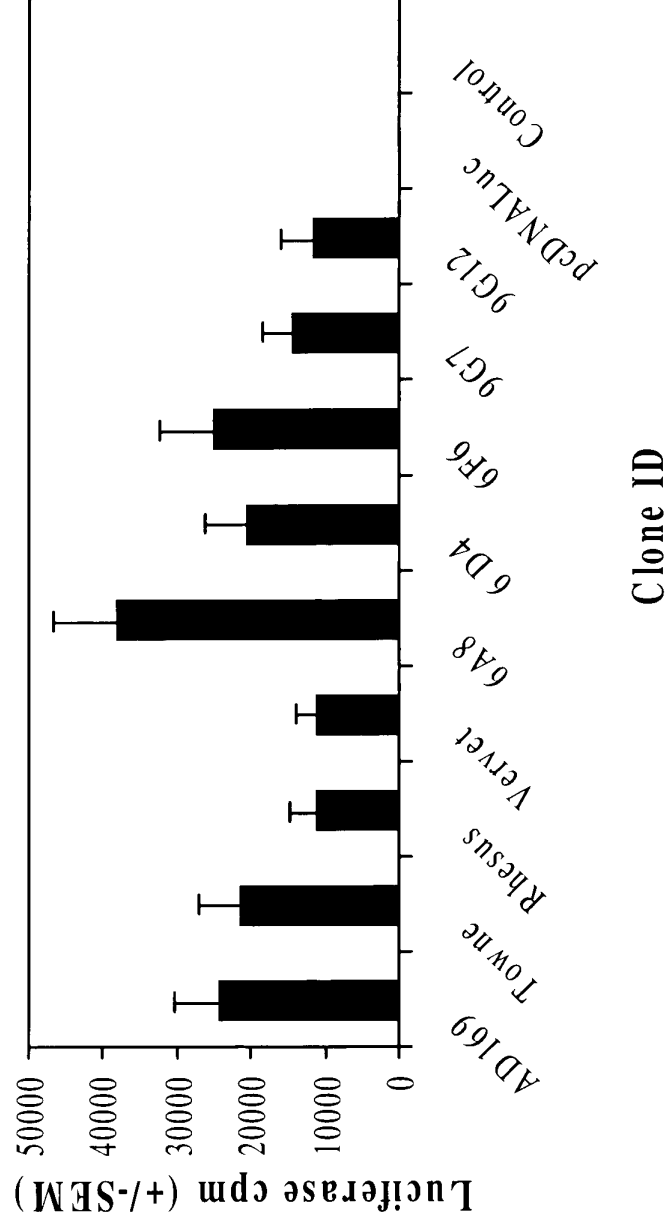


Figure 5: Comparison of Luciferase expression from clone 6A8 and parental clones

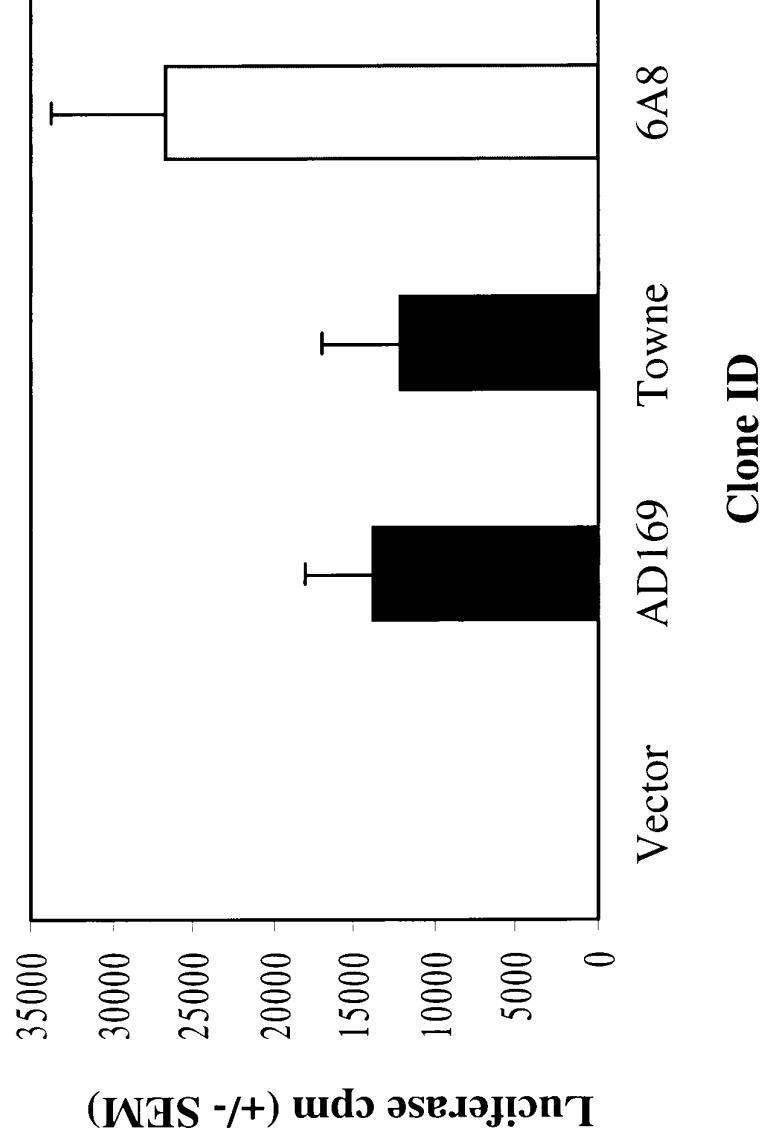


Figure 6A: Antibody responses following injection with β -galactosidase-encoding plasmid

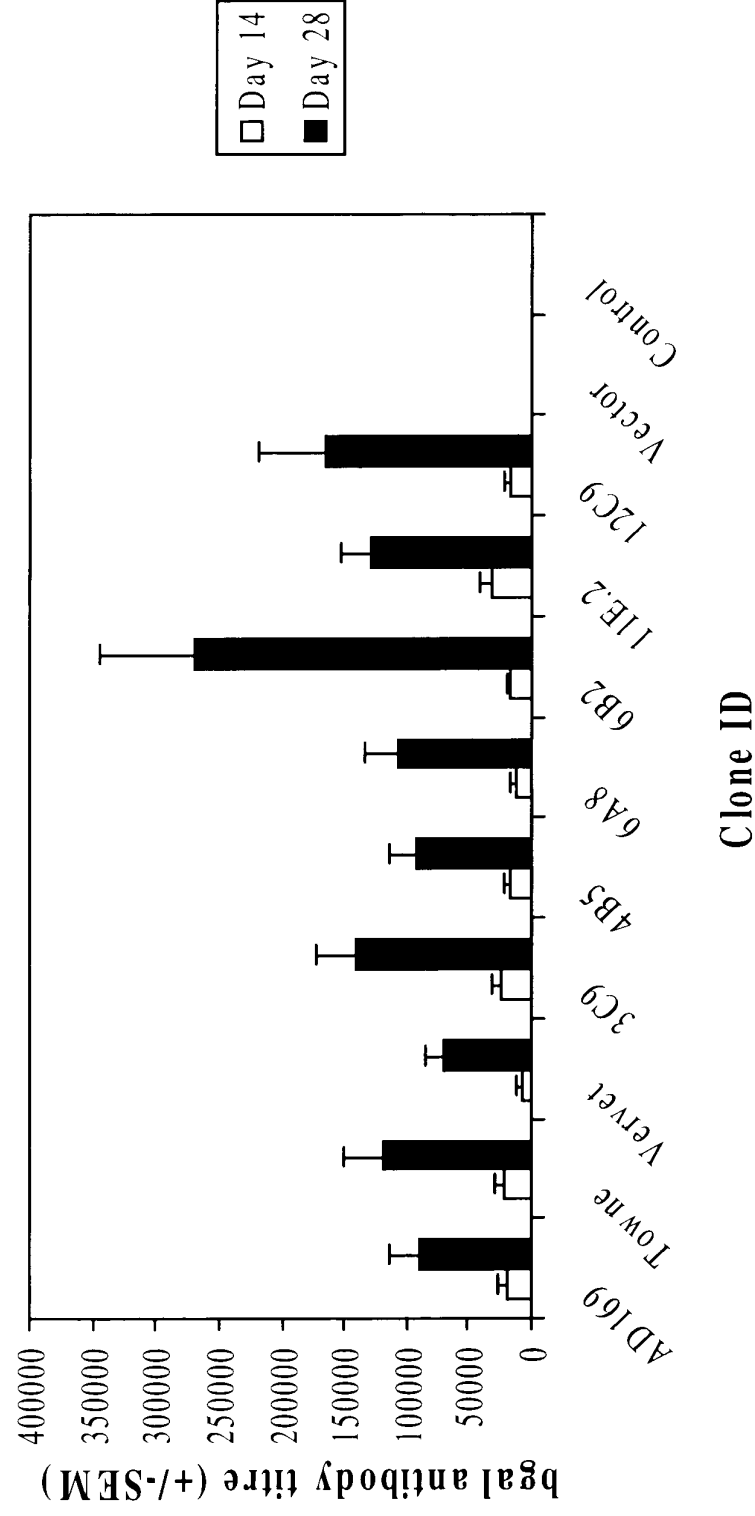


Figure 6B: Improved Ab Response by
Shuffled Promoter

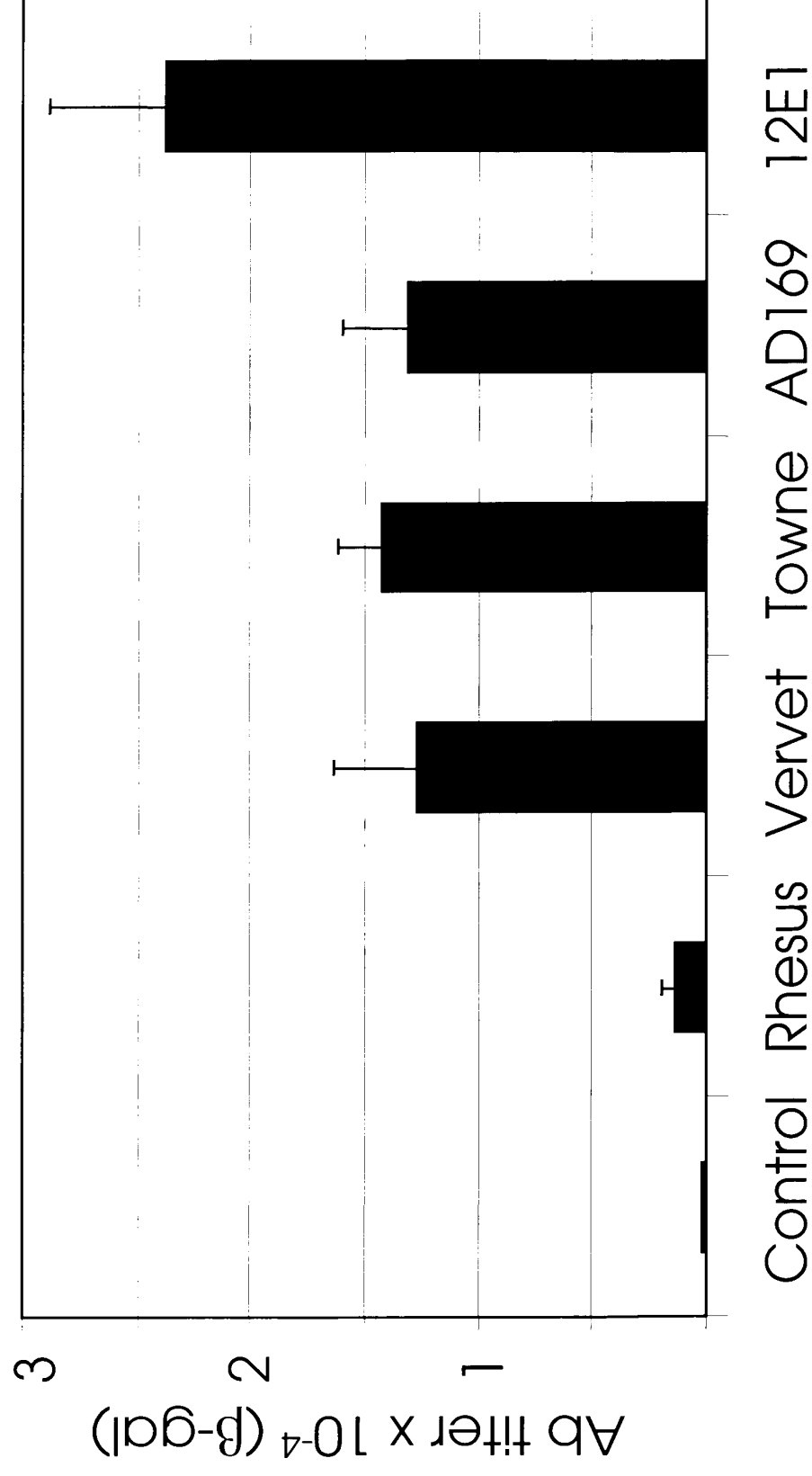


Figure 7: Chimeric promoter 6A8 is functional in human muscle tissue

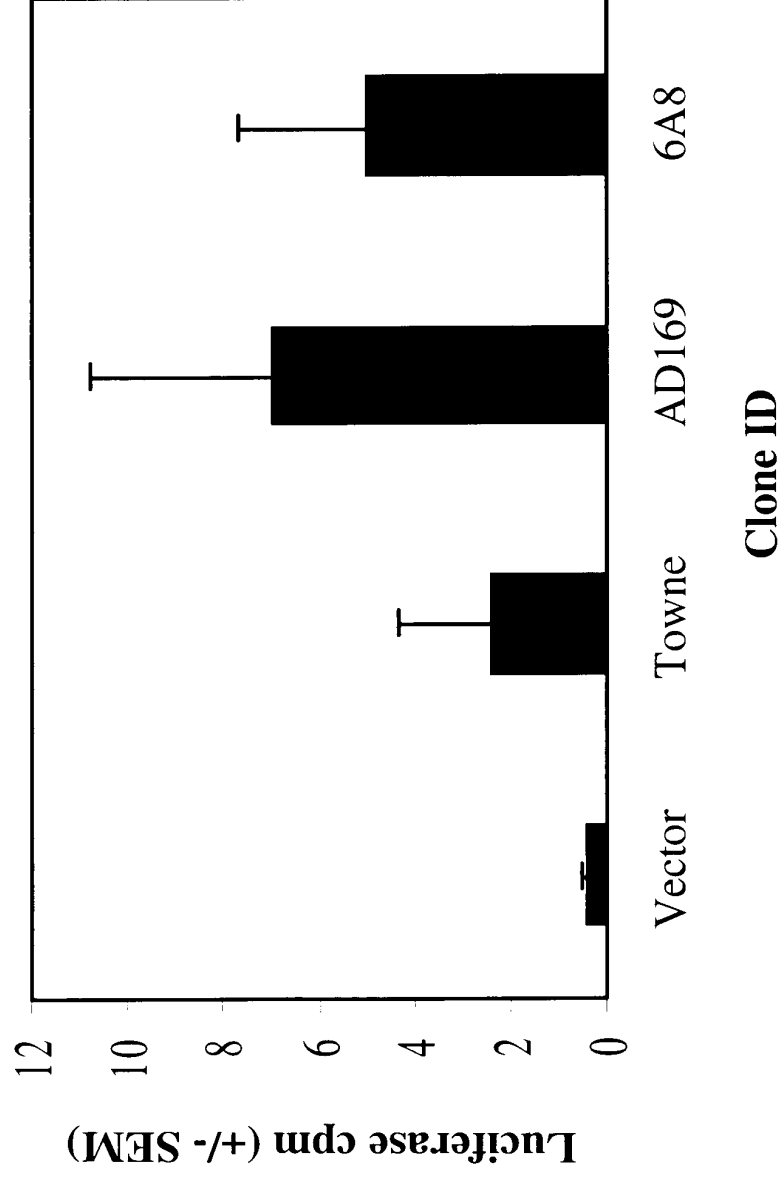


Figure 8A: Comparison of 18 chimeric promoter sequences generated by DNA shuffling using CMV promoter nucleic acid sequences from AD169 and Towne human strains and Rhesus and Vervet monkey strains as parental sequences.

		1	100
10B2	(1)	ATATGAGGCTATATCGCCGATAGAGGCGACATCAAGCTGGCACATGGCCAAATGCATCATGATCAATTAATTAATTAATTTGGCAATTAGCCATATTTG	
11E2	(1)	ATATGAGGCTATATCGCCGATAGAGGCGACATCAAGCTGGCACATGGCCAAATGCATCATGATCAATTAATTAATTAATTTGGCAATTAGCCATATTTAT	
12C9	(1)	ATATGAGGCTATATCGCCGATAGAGGCGACATCAAGCTGGCACATGGCCAAATGCATCATGATCAATTAATTAATTAATTTGGCAATTAGCCATATTTAT	
12E1	(1)	ATATGAGGCTATATCGCCGATAGAGGCGACATCAAGCTGGCACATGGCCAAATGCATCATGATCAATTAATTAATTAATTTGGCAATTAGCCATATTTAG	
12H9	(1)	ATATGAGGCTATATCGCCGATAGAGGCGACATCAAGCTGGCACATGGCCAAATGCATCATGATCAATTAATTAATTAATTTGGCAATTAGCCATATTTAT	
3C9	(1)	ATATGAGGCTATATCGCCGATAGAGGCGACATCAAGCTGGCACATGGCCAAATGCATCATGATCAATTAATTAATTAATTTGGCAATTAGCCATATTTAG	
4B5	(1)	ATATGAGGCTATATCGCCGATAGAGGCGACATCAAGCTGGCACATGGCCAAATGCATCATGATCAATTAATTAATTAATTTGGCAATTAGCCATATTTAG	
6A8	(1)	ATATGAGGCTATATCGCCGATAGAGGCGACATCAAGCTGGCACATGGCCAAATGCATCATGATCAATTAATTAATTAATTTGGCAATTAGCCATATTTAG	
6B2	(1)	ATATGAGGCTATATCGCCGATAGAGGCGACATCAAGCTGGCACATGGCCAAATGCATCATGATCAATTAATTAATTAATTTGGCAATTAGCCATATTTAG	
6D4	(1)	ATATGAGGCTATATCGCCGATAGAGGCGACATCAAGCTGGCACATGGCCAAATGCATCATGATCAATTAATTAATTAATTTGGCAATTAGCCATATTTAT	
6F6	(1)	ATATGAGGCTATATCGCCGATAGAGGCGACATCAAGCTGGCACATGGCCAAATGCATCATGATCAATTAATTAATTAATTTGGCAATTAGCCATATTTAT	
9E1	(1)	ATATGAGGCTATATCGCCGATAGAGGCGACATCAAGCTGGCACATGGCCAAATGCATCATGATCAATTAATTAATTAATTTGGCAATTAGCCATATTTAG	
9F11	(1)	ATATGAGGCTATATCGCCGATAGAGGCGACATCAAGCTGGCACATGGCCAAATGCATCATGATCAATTAATTAATTAATTTGGCAATTAGCCATATTTAT	
9G11	(1)	ATATGAGGCTATATCGCCGATAGAGGCGACATCAAGCTGGCACATGGCCAAATGCATCATGATCAATTAATTAATTAATTTGGCAATTAGCCATATTTAG	
9G12	(1)	ATATGAGGCTATATCGCCGATAGAGGCGACATCAAGCTGGCACATGGCCAAATGCATCATGATCAATTAATTAATTAATTTGGCAATTAGCCATATTTAG	
9G4	(1)	ATATGAGGCTATATCGCCGATAGAGGCGACATCAAGCTGGCACATGGCCAAATGCATCATGATCAATTAATTAATTAATTTGGCAATTAGCCATATTTAG	
9G7	(1)	ATATGAGGCTATATCGCCGATAGAGGCGACATCAAGCTGGCACATGGCCAAATGCATCATGATCAATTAATTAATTAATTTGGCAATTAGCCATATTTAG	
9G8	(1)	ATATGAGGCTATATCGCCGATAGAGGCGACATCAAGCTGGCACATGGCCAAATGCATCATGATCAATTAATTAATTAATTTGGCAATTAGCCATATTTAG	
AD169	(1)	ATATGAGGCTATATCGCCGATAGAGGCGACATCAAGCTGGCACATGGCCAAATGCATCATGATCAATTAATTAATTAATTTGGCAATTAGCCATATTTAG	
Towne	(1)	ATATGAGGCTATATCGCCGATAGAGGCGACATCAAGCTGGCACATGGCCAAATGCATCATGATCAATTAATTAATTAATTTGGCAATTAGCCATATTTAG	
Consensus	(1)	ATATGAGGCTATATCGCCGATAGAGGCGACATCAAGCTGGCACATGGCCAAATGCATCATGATCAATTAATTAATTAATTTGGCAATTAGCCATATTTAG	200
10B2	(101)	TCATTGGTTATATAGCATAAATCAATATTGGCTATTGGCCATTGGCATACGTTGTATCTATATCATATAATATGTACATTTATATTGGCTCATGTCCAATACG	
11E2	(101)	TCATTGGTTATATAGCATAAATCAATATTGGCTATTGGCCATTGGCATACGTTGTATCTATATCATATAATATGTACATTTATATTGGCTCATGTCCAATATG	
12C9	(101)	TCATTGGTTATATAGCATAAATCAATATTGGCTATTGGCCATTGGCATACGTTGTATCTATATCATATAATATGTACATTTATATTGGCTCATGTCCAACATT	
12E1	(101)	TCATTGGTTATATAGCATAAATCAATATTGGCTATTGGCCATTGGCATACGTTGTATCTATATCATATAATATGTACATTTATATTGGCTCATGTCCAATATG	
12H9	(101)	TCATTGGTTATATAGCATAAATCAATATTGGCTATTGGCCATTGGCATACGTTGTATCTATATCATATAATATGTACATTTATATTGGCTCATGTCCAATATG	
3C9	(101)	TCATTGGTTATATAGCATAAATCAATATTGGCTATTGGCCATTGGCATACGTTGTATCTATATCATATAATATGTACATTTATATTGGCTCATGTCCAACATT	
4B5	(101)	TCATTGGTTATATAGCATAAATCAATATTGGCTATTGGCCATTGGCATACGTTGTATCTATATCATATAATATGTACATTTATATTGGCTCATGTCCAATATG	
6A8	(101)	TCATTGGTTATATAGCATAAATCAATATTGGCTATTGGCCATTGGCATACGTTGTATCTATATCATATAATATGTACATTTATATTGGCTCATGTCCAATATG	
6B2	(101)	TCATTGGTTATATAGCATAAATCAATATTGGCTATTGGCCATTGGCATACGTTGTATCTATATCATATAATATGTACATTTATATTGGCTCATGTCCAATATG	
6D4	(101)	TCATTGGTTATATAGCATAAATCAATATTGGCTATTGGCCATTGGCATACGTTGTATCTATATCATATAATATGTACATTTATATTGGCTCATGTCCAATATG	
6F6	(101)	TCATTGGTTATATAGCATAAATCAATATTGGCTATTGGCCATTGGCATACGTTGTATCTATATCATATAATATGTACATTTATATTGGCTCATGTCCAATATG	
9E1	(101)	TCATTGGTTATATAGCATAAATCAATATTGGCTATTGGCCATTGGCATACGTTGTATCTATATCATATAATATGTACATTTATATTGGCTCATGTCCAACATT	
9F11	(101)	TCATTGGTTATATAGCATAAATCAATATTGGCTATTGGCCATTGGCATACGTTGTATCTATATCATATAATATGTACATTTATATTGGCTCATGTCCAATATG	
9G11	(101)	TCATTGGTTATATAGCATAAATCAATATTGGCTATTGGCCATTGGCATACGTTGTATCTATATCATATAATATGTACATTTATATTGGCTCATGTCCAATATG	
9G12	(101)	TCATTGGTTATATAGCATAAATCAATATTGGCTATTGGCCATTGGCATACGTTGTATCTATATCATATAATATGTACATTTATATTGGCTCATGTCCAATATG	
9G4	(101)	TCATTGGTTATATAGCATAAATCAATATTGGCTATTGGCCATTGGCATACGTTGTATCTATATCATATAATATGTACATTTATATTGGCTCATGTCCAATATG	
9G7	(101)	TCATTGGTTATATAGCATAAATCAATATTGGCTATTGGCCATTGGCATACGTTGTATCTATATCATATAATATGTACATTTATATTGGCTCATGTCCAATATG	
9G8	(101)	TCATTGGTTATATAGCATAAATCAATATTGGCTATTGGCCATTGGCATACGTTGTATCTATATCATATAATATGTACATTTATATTGGCTCATGTCCAATATG	
AD169	(101)	TCATTGGTTATATAGCATAAATCAATATTGGCTATTGGCCATTGGCATACGTTGTATCTATATCATATAATATGTACATTTATATTGGCTCATGTCCAACATT	
Towne	(101)	TCATTGGTTATATAGCATAAATCAATATTGGCTATTGGCCATTGGCATACGTTGTATCTATATCATATAATATGTACATTTATATTGGCTCATGTCCAACATT	
Consensus	(101)	TCATTGGTTATATAGCATAAATCAATATTGGCTATTGGCCATTGGCATACGTTGTATCTATATCATATAATATGTACATTTATATTGGCTCATGTCCAATATG	

Figure 8B: Comparison of 18 chimeric promoter sequences generated by DNA shuffling using CMV promoter nucleic acid sequences from AD169 and Towne human strains and Rhesus and Vervet monkey strains as parental sequences.

10B2	201	ACGCCCATGTTGACATTGATTATTGACTAGTATTAAATAGTAATCAATTAACGGGGTCATTAGTTTCATAGCCCCATATATGGAGTTCCCGGTTACATAA	300
11E2	(201)	ACTGCCATGTTGACATTGATTATTGACTAGTATTAAATAGTAATCAATTAACGGGGTCATTAGTTTCATAGCCCCATATATGGAGTTCCCGGTTACATAA	
12C9	(201)	ACGCCCATGTTGACATTGATTATTGACTAGTATTAAATAGTAATCAATTAACGGGGTCATTAGTTTCATAGCCCCATATATGGAGTTCCCGGTTACATAA	
12E1	(201)	ACGCCCATGTTGACATTGATTATTGACTAGTATTAAATAGTAATCAATTAACGGGGTCATTAGTTTCATAGCCCCATATATGGAGTTCCCGGTTACATAA	
12H9	(201)	ACGCCCATGTTGACATTGATTATTGACTAGTATTAAATAGTAATCAATTAACGGGGTCATTAGTTTCATAGCCCCATATATGGAGTTCCCGGTTACATAA	
3C9	(201)	ACGCCCATGTTGACATTGATTATTGACTAGTATTAAATAGTAATCAATTAACGGGGTCATTAGTTTCATAGCCCCATATATGGAGTTCCCGGTTACATAA	
4B5	(201)	ACGCCCATGTTGACATTGATTATTGACTAGTATTAAATAGTAATCAATTAACGGGGTCATTAGTTTCATAGCCCCATATATGGAGTTCCCGGTTACATAA	
6A8	(201)	ACGCCCATGTTGACATTGATTATTGACTAGTATTAAATAGTAATCAATTAACGGGGTCATTAGTTTCATAGCCCCATATATGGAGTTCCCGGTTACATAA	
6B2	(201)	ACGCCCATGTTGACATTGATTATTGACTAGTATTAAATAGTAATCAATTAACGGGGTCATTAGTTTCATAGCCCCATATATGGAGTTCCCGGTTACATAA	
6D4	(201)	ACGCCCATGTTGACATTGATTATTGACTAGTATTAAATAGTAATCAATTAACGGGGTCATTAGTTTCATAGCCCCATATATGGAGTTCCCGGTTACATAA	
6F6	(201)	ACGCCCATGTTGACATTGATTATTGACTAGTATTAAATAGTAATCAATTAACGGGGTCATTAGTTTCATAGCCCCATATATGGAGTTCCCGGTTACATAA	
9E1	(201)	ACGCCCATGTTGACATTGATTATTGACTAGTATTAAATAGTAATCAATTAACGGGGTCATTAGTTTCATAGCCCCATATATGGAGTTCCCGGTTACATAA	
9F11	(201)	ACGCCCATGTTGACATTGATTATTGACTAGTATTAAATAGTAATCAATTAACGGGGTCATTAGTTTCATAGCCCCATATATGGAGTTCCCGGTTACATAA	
9G11	(201)	ACGCCCATGTTGACATTGATTATTGACTAGTATTAAATAGTAATCAATTAACGGGGTCATTAGTTTCATAGCCCCATATATGGAGTTCCCGGTTACATAA	
9G12	(201)	ACGCCCATGTTGACATTGATTATTGACTAGTATTAAATAGTAATCAATTAACGGGGTCATTAGTTTCATAGCCCCATATATGGAGTTCCCGGTTACATAA	
9G4	(201)	ACGCCCATGTTGACATTGATTATTGACTAGTATTAAATAGTAATCAATTAACGGGGTCATTAGTTTCATAGCCCCATATATGGAGTTCCCGGTTACATAA	
9G7	(201)	ACGCCCATGTTGACATTGATTATTGACTAGTATTAAATAGTAATCAATTAACGGGGTCATTAGTTTCATAGCCCCATATATGGAGTTCCCGGTTACATAA	
9G8	(201)	ACGCCCATGTTGACATTGATTATTGACTAGTATTAAATAGTAATCAATTAACGGGGTCATTAGTTTCATAGCCCCATATATGGAGTTCCCGGTTACATAA	
AD169	(201)	ACGCCCATGTTGACATTGATTATTGACTAGTATTAAATAGTAATCAATTAACGGGGTCATTAGTTTCATAGCCCCATATATGGAGTTCCCGGTTACATAA	
Towne	(201)	ACGCCCATGTTGACATTGATTATTGACTAGTATTAAATAGTAATCAATTAACGGGGTCATTAGTTTCATAGCCCCATATATGGAGTTCCCGGTTACATAA	
Consensus	(201)	ACGCCCATGTTGACATTGATTATTGACTAGTATTAAATAGTAATCAATTAACGGGGTCATTAGTTTCATAGCCCCATATATGGAGTTCCCGGTTACATAA	400
10B2	301	ACGGTAAATGGCCCGCTGGCTGACCGCCCAACGACCCCGCCCATGACGTCAATATGACGTATGTTCCCATAGTAACGCCAATAGGGACTTTCCATT	
11E2	(301)	ACGGTAAATGGCCCGCTGGCTGACCGCCCAACGACCCCGCCCATGACGTCAATATGACGTATGTTCCCATAGTAACGCCAATAGGGACTTTCCATT	
12C9	(301)	ACGGTAAATGGCCCGCTGGCTGACCGCCCAACGACCCCGCCCATGACGTCAATATGACGTATGTTCCCATAGTAACGCCAATAGGGACTTTCCATT	
12E1	(301)	ACGGTAAATGGCCCGCTGGCTGACCGCCCAACGACCCCGCCCATGACGTCAATATGACGTATGTTCCCATAGTAACGCCAATAGGGACTTTCCATT	
12H9	(301)	ACGGTAAATGGCCCGCTGGCTGACCGCCCAACGACCCCGCCCATGACGTCAATATGACGTATGTTCCCATAGTAACGCCAATAGGGACTTTCCATT	
3C9	(301)	ACGGTAAATGGCCCGCTGGCTGACCGCCCAACGACCCCGCCCATGACGTCAATATGACGTATGTTCCCATAGTAACGCCAATAGGGACTTTCCATT	
4B5	(301)	ACGGTAAATGGCCCGCTGGCTGACCGCCCAACGACCCCGCCCATGACGTCAATATGACGTATGTTCCCATAGTAACGCCAATAGGGACTTTCCATT	
6A8	(301)	ACGGTAAATGGCCCGCTGGCTGACCGCCCAACGACCCCGCCCATGACGTCAATATGACGTATGTTCCCATAGTAACGCCAATAGGGACTTTCCATT	
6B2	(301)	ACGGTAAATGGCCCGCTGGCTGACCGCCCAACGACCCCGCCCATGACGTCAATATGACGTATGTTCCCATAGTAACGCCAATAGGGACTTTCCATT	
6D4	(301)	ACGGTAAATGGCCCGCTGGCTGACCGCCCAACGACCCCGCCCATGACGTCAATATGACGTATGTTCCCATAGTAACGCCAATAGGGACTTTCCATT	
6F6	(301)	ACGGTAAATGGCCCGCTGGCTGACCGCCCAACGACCCCGCCCATGACGTCAATATGACGTATGTTCCCATAGTAACGCCAATAGGGACTTTCCATT	
9E1	(301)	ACGGTAAATGGCCCGCTGGCTGACCGCCCAACGACCCCGCCCATGACGTCAATATGACGTATGTTCCCATAGTAACGCCAATAGGGACTTTCCATT	
9F11	(301)	ACGGTAGATGGCCCGCTGGCTGACCGCCCAACGACCCCGCCCATGACGTCAATATGACGTATGTTCCCATAGTAACGCCAATAGGGACTTTCCATT	
9G11	(301)	ACGGTAAATGGCCCGCTGGCTGACCGCCCAACGACCCCGCCCATGACGTCAATATGACGTATGTTCCCATAGTAACGCCAATAGGGACTTTCCATT	
9G12	(301)	ACGGTAAATGGCCCGCTGGCTGACCGCCCAACGACCCCGCCCATGACGTCAATATGACGTATGTTCCCATAGTAACGCCAATAGGGACTTTCCATT	
9G4	(301)	ACGGTAGATGGCCCGCTGGCTGACCGCCCAACGACCCCGCCCATGACGTCAATATGACGTATGTTCCCATAGTAACGCCAATAGGGACTTTCCATT	
9G7	(301)	ACGGTAAATGGCCCGCTGGCTGACCGCCCAACGACCCCGCCCATGACGTCAATATGACGTATGTTCCCATAGTAACGCCAATAGGGACTTTCCATT	
9G8	(301)	ACGGTAAATGGCCCGCTGGCTGACCGCCCAACGACCCCGCCCATGACGTCAATATGACGTATGTTCCCATAGTAACGCCAATAGGGACTTTCCATT	
AD169	(301)	ACGGTAAATGGCCCGCTGGCTGACCGCCCAACGACCCCGCCCATGACGTCAATATGACGTATGTTCCCATAGTAACGCCAATAGGGACTTTCCATT	
Towne	(301)	ACGGTAAATGGCCCGCTGGCTGACCGCCCAACGACCCCGCCCATGACGTCAATATGACGTATGTTCCCATAGTAACGCCAATAGGGACTTTCCATT	
Consensus	(301)	ACGGTAAATGGCCCGCTGGCTGACCGCCCAACGACCCCGCCCATGACGTCAATATGACGTATGTTCCCATAGTAACGCCAATAGGGACTTTCCATT	

Figure 8C: Comparison of 18 chimeric promoter sequences generated by DNA shuffling using CMV promoter nucleic acid sequences from AD169 and Towne human strains and Rhesus and Vervet monkey strains as parental sequences.

		401	500
10B2	(401)	GACGTC	AAATGGGTGGAGTATTTACGGTAAACTGCCACCTTGGCAGTACATCAAGTGATATCATATGCCAAGTCCG-CCCCCTATTGACGTC
11E2	(401)	GACGTC	AAATGGGTGGAGTATTTACGGTAAACTGGTCACTTGGCAGTACATCAAGTGATATCATATGCCAAGTACG-CCCCCTATTGACGTC
12C9	(401)	GACGTC	AAATGGGTGGAGTATTTACGGTAAACTGCCACCTTGGCAGTACATCAAGTGATATCATATGCCAAGTCCG-CCCCCTATTGACGTC
12E1	(401)	GACGTC	AAATGGGTGGAGTATTTACGGTAAACTGCCACCTTGGCAGTACATCAAGTGATATCATATGCCAAGTCCG-CCCCCTATTGACGTC
12H9	(401)	GACGTC	AAATGGGTGGAGTATTTACGGTAAACTGCCACCTTGGCAGTACATCAAGTGATATCATATGCCAAGTCCG-CCCCCTATTGACGTC
3C9	(401)	GACGTC	AAATGGGTGGAGTATTTACGGTAAACTGCCACCTTGGCAGTACATCAAGTGATATCATATGCCAAGTCCG-CCCCCTATTGACGTC
4B5	(401)	GACGTC	AAATGGGTGGAGTATTTACGGTAAACTGCCACCTTGGCAGTACATCAAGTGATATCATATGCCAAGTCCG-CCCCCTATTGACGTC
6A8	(401)	GACGTC	AAATGGGTGGAGTATTTACGGTAAACTGCCACCTTGGCAGTACATCAAGTGATATCATATGCCAAGTCCG-CCCCCTATTGACGTC
6B2	(401)	GACGTC	AAATGGGTGGAGTATTTACGGTAAACTGCCACCTTGGCAGTACATCAAGTGATATCATATGCCAAGTCCG-CCCCCTATTGACGTC
6D4	(401)	GACGTC	AAATGGGTGGAGTATTTACGGTAAACTGCCACCTTGGCAGTACATCAAGTGATATCATATGCCAAGTCCG-CCCCCTATTGACGTC
6F6	(401)	GACGTC	GAATGGGTGGAGTATTTACGGTAAACTGCCACCTTGGCAGTACATCAAGTGATATCATATGCCAAGTCCG-CCCCCTATTGACGTC
9E1	(319)	-----	-----
9F11	(401)	GACGTC	AAATGGGTGGAGTATTTACGGTAAACTGCCACCTTGGCAGTACATCAAGTGATATCATATGCCAAGTCCG-CCCCCTATTGACGTC
9G11	(401)	GACGTC	AAATGGGTGGAGTATTTACGGTAAACTGCCACCTTGGCAGTACATCAAGTGATATCATATGCCAAGTCCG-CCCCCTATTGACGTC
9G12	(401)	GACGTC	AAATGGGTGGAGTATTTACGGTAAACTGCCACCTTGGCAGTACATCAAGTGATATCATATGCCAAGTCCG-CCCCCTATTGACGTC
9G4	(401)	GACGTC	AAATGGGTGGAGTATTTACGGTAAACTGCCACCTTGGCAGTACATCAAGTGATATCATATGCCAAGTCCG-CCCCCTATTGACGTC
9G7	(401)	GACGTC	AAATGGGTGGAGTATTTACGGTAAACTGCCACCTTGGCAGTACATCAAGTGATATCATATGCCAAGTCCG-CCCCCTATTGACGTC
9G8	(401)	GACGTC	AAATGGGTGGAGTATTTACGGTAAACTGCCACCTTGGCAGTACATCAAGTGATATCATATGCCAAGTCCG-CCCCCTATTGACGTC
AD169	(401)	GACGTC	AAATGGGTGGAGTATTTACGGTAAACTGCCACCTTGGCAGTACATCAAGTGATATCATATGCCAAGTCCG-CCCCCTATTGACGTC
Towne	(400)	GACGTC	AAATGGGTGGAGTATTTACGGTAAACTGCCACCTTGGCAGTACATCAAGTGATATCATATGCCAAGTCCG-CCCCCTATTGACGTC
Consensus	(401)	GACGTC	AAATGGGTGGAGTATTTACGGTAAACTGCCACCTTGGCAGTACATCAAGTGATATCATATGCCAAGTCCG-CCCCCTATTGACGTC
		501	600
10B2	(500)	AATGGC	CCCGCTGGCATTTATGCCAGTACATGACCTTACGGGCTTTCTCCTACTTGGCAGTACATCTACGPTATTAGTCATCGCTATTACCATTGGTGATGCG
11E2	(500)	AATGGC	CCCGCTGGCATTTATGCCAGTACATGACCTTACGGGCTTTCTCCTACTTGGTAGTACATCTACGPTATTAGTCATCGCTATTACCATTGGTGATGCG
12C9	(500)	AATGGC	CCCGCTGGCATTTATGCCAGTACATGACCTTACGGGCTTTCTCCTACTTGGCAGTACATCTACGPTATTAGTCATCGCTATTACCATTGGTGATGCG
12E1	(500)	AATGGC	CCCGCTGGCATTTATGCCAGTACATGACCTTACGGGCTTTCTCCTACTTGGCAGTACATCTACGPTATTAGTCATCGCTATTACCATTGGTGATGCG
12H9	(500)	AATGGC	CCCGCTGGCATTTATGCCAGTACATGACCTTACGGGCTTTCTCCTACTTGGCAGTACATCTACGPTATTAGTCATCGCTATTACCATTGGTGATGCG
3C9	(501)	AATGGC	CCCGCTGGCATTTATGCCAGTACATGACCTTACGGGCTTTCTCCTACTTGGCAGTACATCTACGPTATTAGTCATCGCTATTACCATTGGTGATGCG
4B5	(500)	AATGGC	CCCGCTGGCATTTATGCCAGTACATGACCTTACGGGCTTTCTCCTACTTGGCAGTACATCTACGPTATTAGTCATCGCTATTACCATTGGTGATGCG
6A8	(500)	AATGGC	CCCGCTGGCATTTATGCCAGTACATGACCTTACGGGCTTTCTCCTACTTGGCAGTACATCTACGPTATTAGTCATCGCTATTACCATTGGTGATGCG
6B2	(500)	AATGGC	CCCGCTGGCATTTATGCCAGTACATGACCTTACGGGCTTTCTCCTACTTGGCAGTACATCTACGPTATTAGTCATCGCTATTACCATTGGTGATGCG
6D4	(500)	AATGGC	CCCGCTGGCATTTATGCCAGTACATGACCTTACGGGCTTTCTCCTACTTGGCAGTACATCTACGPTATTAGTCATCGCTATTACCATTGGTGATGCG
6F6	(500)	AATGGC	CCCGCTGGCATTTATGCCAGTACATGACCTTACGGGCTTTCTCCTACTTGGCAGTACATCTACGPTATTAGTCATCGCTATTACCATTGGTGATGCG
9E1	(319)	-----	-----
9F11	(500)	AATGGC	CCCGCTGGCATTTATGCCAGTACATGACCTTACGGGCTTTCTCCTACTTGGCAGTACATCTACGPTATTAGTCATCGCTATTACCATTGGTGATGCG
9G11	(500)	AATGGC	CCCGCTGGCATTTATGCCAGTACATGACCTTACGGGCTTTCTCCTACTTGGCAGTACATCTACGPTATTAGTCATCGCTATTACCATTGGTGATGCG
9G12	(500)	AATGGC	CCCGCTGGCATTTATGCCAGTACATGACCTTACGGGCTTTCTCCTACTTGGCAGTACATCTACGPTATTAGTCATCGCTATTACCATTGGTGATGCG
9G4	(500)	AATGGC	CCCGCTGGCATTTATGCCAGTACATGACCTTACGGGCTTTCTCCTACTTGGCAGTACATCTACGPTATTAGTCATCGCTATTACCATTGGTGATGCG
9G7	(500)	AATGGC	CCCGCTGGCATTTATGCCAGTACATGACCTTACGGGCTTTCTCCTACTTGGCAGTACATCTACGPTATTAGTCATCGCTATTACCATTGGTGATGCG
9G8	(500)	AATGGC	CCCGCTGGCATTTATGCCAGTACATGACCTTACGGGCTTTCTCCTACTTGGCAGTACATCTACGPTATTAGTCATCGCTATTACCATTGGTGATGCG
AD169	(500)	AATGGC	CCCGCTGGCATTTATGCCAGTACATGACCTTACGGGCTTTCTCCTACTTGGCAGTACATCTACGPTATTAGTCATCGCTATTACCATTGGTGATGCG
Towne	(500)	AATGGC	CCCGCTGGCATTTATGCCAGTACATGACCTTACGGGCTTTCTCCTACTTGGCAGTACATCTACGPTATTAGTCATCGCTATTACCATTGGTGATGCG
Consensus	(501)	AATGGC	CCCGCTGGCATTTATGCCAGTACATGACCTTACGGGCTTTCTCCTACTTGGCAGTACATCTACGPTATTAGTCATCGCTATTACCATTGGTGATGCG

Figure 8D: Comparison of 18 chimeric promoter sequences generated by DNA shuffling using CMV promoter nucleic acid sequences from AD169 and Towne human strains and Rhesus and Vervet monkey strains as parental sequences.

		601		700
10B2	(600)	GTTTTGGCAGTACACCAATGGGCGTGGATAGCGGTTTGACTCACGGGGAATTCACAGTCTCCACCCCAATTGACGTCAAATGGGAGTTGTTTGGCACCCAA		
11E2	(600)	GTTTTGGCAGTACACCAATGGGCGTGGATAGCGGTTTGACTCACGGGGAATTCACAGTCTCCACCCCAATTGACGTCAAATGGGAGTTGTTTGGCACCCAA		
12C9	(600)	GTTTTGGCAGTACACCAATGGGCGTGGATAGCGGTTTGACTCACGGGGAATTCACAGTCTCCACCCCAATTGACGTCAAATGGGAGTTGTTTGGCACCCAA		
12E1	(600)	GTTTTGGCAGTACACCAATGGGCGTGGATAGCGGTTTGACTCACGGGGAATTCACAGTCTCCACCCCAATTGACGTCAAATGGGAGTTGTTTGGCACCCAA		
12H9	(600)	GTTTTGGCAGTACACCAATGGGCGTGGATAGCGGTTTGACTCACGGGGAATTCACAGTCTCCACCCCAATTGACGTCAAATGGGAGTTGTTTGGCACCCAA		
3C9	(601)	GTTTTGGCGGTACATCAATGGGCGTGGATAGCGGTTTGACTCACGGGGAATTCACAGTCTCCACCCCAATTGACGTCAAATGGGAGTTGTTTGGCACCCAA		
4B5	(600)	GTTTTGGCAGTACATCAATGGGCGTGGATAGCGGTTTGACTCACGGGGAATTCACAGTCTCCACCCCAATTGACGTCAAATGGGAGTTGTTTGGCACCCAA		
6A8	(600)	GTTTTGGCAGTACATCAATGGGCGTGGATAGCGGTTTGACTCACGGGGAATTCACAGTCTCCACCCCAATTGACGTCAAATGGGAGTTGTTTGGCACCCAA		
6B2	(600)	GTTTTGGCAGTACACCAATGGGCGTGGATAGCGGTTTGACTCACGGGGAATTCACAGTCTCCACCCCAATTGACGTCAAATGGGAGTTGTTTGGCACCCAA		
6D4	(600)	GTTTTGGCAGTACATCAATGGGCGTGGATAGCGGTTTGACTCACGGGGAATTCACAGTCTCCACCCCAATTGACGTCAAATGGGAGTTGTTTGGCACCCAA		
6F6	(600)	GTTTTGGCAGTACACCAATGGGCGTGGATAGCGGTTTGACTCACGGGGAATTCACAGTCTCCACCCCAATTGACGTCAAATGGGAGTTGTTTGGCACCCAA		
9E1	(407)	GTTTTGGCAGTACACCAATGGGCGTGGATAGCGGTTTGACTCACGGGGAATTCACAGTCTCCACCCCAATTGACGTCAAATGGGAGTTGTTTGGCACCCAA		
9F11	(600)	GTTTTGGCAGTACATCAATGGGCGTGGATAGCGGTTTGACTCACGGGGAATTCACAGTCTCCACCCCAATTGACGTCAAATGGGAGTTGTTTGGCACCCAA		
9G11	(600)	GTTTTGGCAGTACACCAATGGGCGTGGATAGCGGTTTGACTCACGGGGAATTCACAGTCTCCACCCCAATTGACGTCAAATGGGAGTTGTTTGGCACCCAA		
9G12	(600)	GTTTTGGCAGTACACCAATGGGCGTGGATAGCGGTTTGACTCACGGGGAATTCACAGTCTCCACCCCAATTGACGTCAAATGGGAGTTGTTTGGCACCCAA		
9G4	(600)	GTTTTGGCGGTACATCAATGGGCGTGGATAGCGGTTTGACTCACGGGGAATTCACAGTCTCCACCCCAATTGACGTCAAATGGGAGTTGTTTGGCACCCAA		
9G7	(600)	GTTTTGGCAGTACACCAATGGGCGTGGATAGCGGTTTGACTCACGGGGAATTCACAGTCTCCACCCCAATTGACGTCAAATGGGAGTTGTTTGGCACCCAA		
9G8	(600)	GTTTTGGCAGTACACCAATGGGCGTGGATAGCGGTTTGACTCACGGGGAATTCACAGTCTCCACCCCAATTGACGTCAAATGGGAGTTGTTTGGCACCCAA		
AD169	(600)	GTTTTGGCAGTACATCAATGGGCGTGGATAGCGGTTTGACTCACGGGGAATTCACAGTCTCCACCCCAATTGACGTCAAATGGGAGTTGTTTGGCACCCAA		
Towne	(600)	GTTTTGGCAGTACACCAATGGGCGTGGATAGCGGTTTGACTCACGGGGAATTCACAGTCTCCACCCCAATTGACGTCAAATGGGAGTTGTTTGGCACCCAA		
Consensus	(601)	GTTTTGGCAGTACACCAATGGGCGTGGATAGCGGTTTGACTCACGGGGAATTCACAGTCTCCACCCCAATTGACGTCAAATGGGAGTTGTTTGGCACCCAA		800
		701		
10B2	(700)	AATCAACGGGACCTTCCAAAATGTCGTAATAACCCCGCCCGGTTGACGCAATGGGCGGTAGGCGGTGACGGTGGAGGTCCTATATAAGCAATGCTCGTT		
11E2	(700)	AATCAACGGGACCTTCCAAAATGTCGTAATAACCCCGCCCGGTTGACGCAATGGGCGGTAGGCGGTGACGGTGGAGGTCCTATATAAGCAGAGCTCGTT		
12C9	(700)	AATCAACGGGACCTTCCAAAATGTCGTAATAACCTCCGCCCGCTGACGCAATGGGCGGTAGGCGGTGACGGTGGAGGTCCTATATAAGCAATGCTCGTT		
12E1	(683)	-----CGGTCCCTATGACGCAATGGGCGGTAGGCGGTGACGGTGGAGGTCCTATATAAGCAGAGCTCGTT		
12H9	(700)	AATCAACGGGACCTTCCAAAATGTCGTAATAACCCCGCCCGGTTGACGCAATGGGCGGTAGGCGGTGACGGTGGAGGTCCTATATAAGCAGAGCTCGTT		
3C9	(701)	AATCAACGGGACCTTCCAAAATGTCGTAATAACCCCGCCCGGTTGACGCAATGGGCGGTAGGCGGTGACGGTGGAGGTCCTATATAAGCAGAGCTCGTT		
4B5	(683)	-----CGGTCCCTATGACGCAATGGGCGGTAGGCGGTGACGGTGGAGGTCCTATATAAGCAGAGCTCGTT		
6A8	(700)	AATCAACGGGACCTTCCAAAATGTCGTAATAACCCCGCCCGGTTGACGCAATGGGCGGTAGGCGGTGACGGTGGAGGTCCTATATAAGCAGAGCTCGTT		
6B2	(683)	-----CGGTCCCTATGACGCAATGGGCGGTAGGCGGTGACGGTGGAGGTCCTATATAAGCAGAGCTCGTT		
6D4	(683)	-----CGGTCCCTATGACGCAATGGGCGGTAGGCGGTGACGGTGGAGGTCCTATATAAGCAGAGCTCGTT		
6F6	(700)	AATCAACGGGACCTTCCAAAATGTCGTAATAACCCCGCCCGGTTGACGCAATGGGCGGTAGGCGGTGACGGTGGAGGTCCTATATAAGCAGAGCTCGTT		
9E1	(507)	AATCAACGGGACCTTCCAAAATGTCGTAATAACCCCGCCCGGTTGACGCAATGGGCGGTAGGCGGTGACGGTGGAGGTCCTATATAAGCAGAGCTCGTT		
9F11	(700)	AATCAACGGGACCTTCCAAAATGTCGTAATAACCCCGCCCGGTTGACGCAATGGGCGGTAGGCGGTGACGGTGGAGGTCCTATATAAGCAGAGCTCGTT		
9G11	(700)	AATCAACGGGACCTTCCAAAATGTCGTAATAACCCCGCCCGGTTGACGCAATGGGCGGTAGGCGGTGACGGTGGAGGTCCTATATAAGCAGAGCTCGTT		
9G12	(700)	AATCAACGGGACCTTCCAAAATGTCGTAATAACCCCGCCCGGTTGACGCAATGGGCGGTAGGCGGTGACGGTGGAGGTCCTATATAAGCAGAGCTCGTT		
9G4	(700)	AATCAACGGGACCTTCCAAAATGTCGTAATAACCCCGCCCGGTTGACGCAATGGGCGGTAGGCGGTGACGGTGGAGGTCCTATATAAGCAGAGCTCGTT		
9G7	(700)	AGTCAACGGGACCTTCCAAAATGTCGTAATAACCCCGCCCGGTTGACGCAATGGGCGGTAGGCGGTGACGGTGGAGGTCCTATATAAGCAGAGCTCGTT		
9G8	(700)	AATCAACGGGACCTTCCAAAATGTCGTAATAACCCCGCCCGGTTGACGCAATGGGCGGTAGGCGGTGACGGTGGAGGTCCTATATAAGCAGAGCTCGTT		
AD169	(700)	AATCAACGGGACCTTCCAAAATGTCGTAATAACCCCGCCCGGTTGACGCAATGGGCGGTAGGCGGTGACGGTGGAGGTCCTATATAAGCAGAGCTCGTT		
Towne	(700)	AATCAACGGGACCTTCCAAAATGTCGTAATAACCCCGCCCGGTTGACGCAATGGGCGGTAGGCGGTGACGGTGGAGGTCCTATATAAGCAGAGCTCGTT		
Consensus	(701)	AATCAACGGGACCTTCCAAAATGTCGTAATAACCCCGCCCGGTTGACGCAATGGGCGGTAGGCGGTGACGGTGGAGGTCCTATATAAGCAGAGCTCGTT		

Figure 8E: Comparison of 18 chimeric promoter sequences generated by DNA shuffling using CMV promoter nucleic acid sequences from AD169 and Towne human strains and Rhesus and Vervet monkey strains as parental sequences.

		801		900
10B2	(800)	TAGTGAACCGTCAGATCGCCCTGGAGACGCCATCCACGCTGTTTGTACCTCCAT-AGAAGACACCGGGACCGATCCAGCCTCCGCGCGGGAAACGGTGCA		
11E2	(800)	TAGGAAACCGCCATTCTGCCCTGGGAGCG-----CGGAG---GAGCTCCATTGGAAGACCGGACCGGATCCAGCCTCCGCGCGGGAAACGGTGCA		
12C9	(800)	TAGGAAACCGCCATTCTGCCCTGGGAGCG-----CGGAG---GAGCACCAT-AGAAGACACCGGACCGGATCCAGCCTCCATAGCCGGGACGGTGCA		
12E1	(748)	TAGTGAACCGTCAGATCGCCCTGGAGACGCCATCCACGCTGTTTGTACCTCCAT-AGAAGACACCGGGACCGGATCCAGCCTCCGCGCGGGAAACGGTGCA		
12H9	(800)	TAGTGAACCGTCAGATCGCCCTGGAGACGCCATCCACGCTGTTTGTACCTCCAT-AGAAGACACCGGACCGGATCCAGCCTCCGCGCGGGAAACGGTGCA		
3C9	(801)	TAGTGAACCGTCAGATCGCCCTGGAGACGCCATCCACGCTGTTTGTACCTCCAT-AGAAGACACCGGACCGGATCCAGCCTCCGCGCGGGAAACGGTGCA		
4B5	(748)	TAGTGAACCGTCAGATCGCCCTGGAGACGCCATCCACGCTGTTTGTACCTCCAT-AGAAGACACCGGACCGGATCCAGCCTCCGCGCGGGAAACGGTGCA		
6A8	(800)	TAGTGAACCGTCAGATCGCCCTGGAGACGCCATCCACGCTGTTTGTACCTCCAT-AGAAGACACCGGACCGGATCCAGCCTCCGCGCGGGAAACGGTGCA		
6B2	(748)	TAGTGAACCGTCAGATCGCCCTGGAGACGCCATCCACGCTGTTTGTACCTCCAT-AGAAGACACCGGACCGGATCCAGCCTCCGCGCGGGAAACGGTGCA		
6D4	(748)	TAGTGAACCGTCAGATCGCCCTGGAGACGCCATCCACGCTGTTTGTACCTCCAT-AGAAGACACCGGACCGGATCCAGCCTCCGCGCGGGAAACGGTGCA		
6F6	(800)	TAGTGAACCGCCATTCTGCCCTGGGAGCT-----CGGAG---GAGCACCAT-AGAAGGTACCGGGACCGGATCCAGCCTCCATAGCCGGGAACGGTGCA		
9E1	(607)	TAGTGAACCGTCAGATCGCCCTGGAGACGCCATCCACGCTGTTTGTACCTCCAT-AGAAGACACCGGACCGGATCCAGCCTCCGCGCGGGAAACGGTGCA		
9F11	(799)	TAGTGAACCGTCAGATCGCCCTGGAGACGCCATCCACGCTGTTTGTACCTCCAT-AGAAGACACCGGACCGGATCCAGCCTCCGCGCGGGAAACGGTGCA		
9G11	(800)	TAGTGAACCGTCAGATCGCCCTGGAGACGCCATCCACGCTGTTTGTACCTCCAT-AGAAGACACCGGACCGGATCCAGCCTCCGCGCGGGAAACGGTGCA		
9G12	(800)	TAGTGAACCGTCAGATCGCCCTGGAGACGCCATCCACGCTGTTTGTACCTCCAT-AGAAGACACCGGACCGGATCCAGCCTCCGCGCGGGAAACGGTGCA		
9G4	(800)	TAGTGAACCGTCAGATCGCCCTGGAGACGCCATCCACGCTGTTTGTACCTCCAT-AGAAGACACCGGACCGGATCCAGCCTCCGCGCGGGAAACGGTGCA		
9G7	(800)	TAGTGAACCGTCAGATCGCCCTGGAGACGCCATCCACGCTGTTTGTACCTCCAT-AGAAGACACCGGACCGGATCCAGCCTCCGCGCGGGAAACGGTGCA		
9G8	(800)	TAGTGAACCGTCAGATCGCCCTGGAGACGCCATCCACGCTGTTTGTACCTCCAT-AGAAGACACCGGACCGGATCCAGCCTCCGCGCGGGAAACGGTGCA		
AD169	(799)	TAGTGAACCGTCAGATCGCCCTGGAGACGCCATCCACGCTGTTTGTACCTCCAT-AGAAGACACCGGACCGGATCCAGCCTCCGCGCGGGAAACGGTGCA		
Towne	(800)	TAGTGAACCGTCAGATCGCCCTGGAGACGCCATCCACGCTGTTTGTACCTCCAT-AGAAGACACCGGACCGGATCCAGCCTCCGCGCGGGAAACGGTGCA		
Consensus	(801)	TAGTGAACCGTCAGATCGCCCTGGAGACGCCATCCACGCTGTTTGTACCTCCAT AGAAGACACCGGACCGGATCCAGCCTCCGCGCGGGAAACGGTGCA		1000
		901		
10B2	(899)	TTGGAACGCGGATTCCCGTGCCAAAGTAGACGTAAGTACCGCCTATAGACTCTATAGGCACACCCCTTTGGCT-CTTATGCATGCTACTACTGTTTTTGG		
11E2	(890)	TTGGAACGCGGATTCCCGTGCCGAGATGACGTAAGTACCGCCTATAGACTCTATAGGCACACCCCTTTGGCT-CTTATGCATGCTACTACTGTTTTTGG		
12C9	(889)	TTGGAACGC-----		
12E1	(847)	TTGGAACGCGGATTCCCGTGCCAAAGTAGACGTAAGTACCGCCTATAGAGTCTATAGGCCCCACCCCTTTGGCTTCTTATGCATGCTACTACTGTTTTTGG		
12H9	(899)	TTGGAACGCGGATTCCCGTGCCAAAGTAGACGTAAGTACCGCCTATAGACTCTATAGGCACACCCCTTTGGCT-CTTATGCATGCTACTACTGTTTTTGG		
3C9	(900)	TTGGAACGCGGATTCCCGTGCCAAAGTAGACGTAAGTACCGCCTATAGACTCTATAGGCACACCCCTTTGGCT-CTTATGCATGCTACTACTGTTTTTGG		
4B5	(847)	TTGGAACGCGGATTCCCGTGCCAAAGTAGACGTAAGTACCGCCTATAGACTCTATAGGCACACCCCTTTGGCT-CTTATGCATGCTACTACTGTTTTTGG		
6A8	(899)	TTGGAACGCGGATTCCCGTGCCAAAGTAGACGTAAGTACCGCCTATAGACTCTATAGGCACACCCCTTTGGCT-CTTATGCATGCTACTACTGTTTTTGG		
6B2	(847)	TTGGAACGCGGATTCCCGTGCCAAAGTAGACGTAAGTACCGCCTATAGACTCTATAGGCACACCCCTTTGGCT-CTTATGCATGCTACTACTGTTTTTGG		
6D4	(847)	TTGGAACGCGGATTCCCGTGCCAAAGTAGACGTAAGTACCGCCTATAGACTCTATAGGCACACCCCTTTGGCT-CTTATGCATGCTACTACTGTTTTTGG		
6F6	(889)	TTGGAACGCGGATTCCCGTGCCAAAGTAGACGTAAGTACCGCCTATAGACTCTATAGGCACACCCCTTTGGCT-CTTATGCATGCTACTACTGTTTTTGG		
9E1	(706)	TTGGAACGCGGATTCCCGTGCCAAAGTAGACGTAAGTACCGCCTATAGACTCTATAGGCACACCCCTTTGGCT-CTTATGCATGCTACTACTGTTTTTGG		
9F11	(898)	TTGGAACGCGGATTCCCGTGCCAAAGTAGACGTAAGTACCGCCTATAGACTCTATAGGCACACCCCTTTGGCT-CTTATGCATGCTACTACTGTTTTTGG		
9G11	(899)	TTGGAACGCGGATTCCCGTGCCAAAGTAGACGTAAGTACCGCCTATAGACTCTATAGGCACACCCCTTTGGCT-CTTATGCATGCTACTACTGTTTTTGG		
9G12	(899)	TTGGAACGCGGATTCCCGTGCCAAAGTAGACGTAAGTACCGCCTATAGACTCTATAGGCACACCCCTTTGGCT-CTTATGCATGCTACTACTGTTTTTGG		
9G4	(899)	TTGGAACGCGGATTCCCGTGCCAAAGTAGACGTAAGTACCGCCTATAGACTCTATAGGCACACCCCTTTGGCT-CTTATGCATGCTACTACTGTTTTTGG		
9G8	(899)	TTGGAACGCGGATTCCCGTGCCAAAGTAGACGTAAGTACCGCCTATAGACTCTATAGGCACACCCCTTTGGCT-CTTATGCATGCTACTACTGTTTTTGG		
AD169	(898)	TTGGAACGCGGATTCCCGTGCCAAAGTAGACGTAAGTACCGCCTATAGACTCTATAGGCACACCCCTTTGGCT-CTTATGCATGCTACTACTGTTTTTGG		
Towne	(899)	TTGGAACGCGGATTCCCGTGCCAAAGTAGACGTAAGTACCGCCTATAGACTCTATAGGCACACCCCTTTGGCT-CTTATGCATGCTACTACTGTTTTTGG		
Consensus	(901)	TTGGAACGCGGATTCCCGTGCCAAAGTAGACGTAAGTACCGCCTATAGACTCTATAGGCACACCCCTTTGGCT CTTATGCATGCTACTACTGTTTTTGG		

Figure 8F: Comparison of 18 chimeric promoter sequences generated by DNA shuffling using CMV promoter nucleic acid sequences from AD169 and Towne human strains and Rhesus and Vervet monkey strains as parental sequences.

		1001	
10B2	(998)	CTTGGGCTCTATACACCCCGCTTCTTATGCTATAGGTGATGGTATAGCTTAGCTTAGGCTTAGGCTGGGTTATTGACCATTTTGACCACTCCCCCTATTGG	1100
11E2	(989)	CTTGGGGCTATACACCCCGCTTCTTATGCTATAGGTGATGGTATAGCTTAGCCTTAGGCTTAGGCTGGGTTATTGACCATTTTGACCACTCCCCCTATTGG	
12C9	(898)	-----	
12E1	(947)	CTTGGGGCTATACACCCCGCTTCTTATGCTATAGGTGATGGTATAGCTTAGCCTTAGGCTTAGGCTGGGTTATTGACCATTTTGACCACTCCCCCTATTGG	
12H9	(998)	CTTGGGGCTATACACCCCGCTTCTTATGCTATAGGTGATGGTATAGCTTAGCCTTAGGCTTAGGCTGGGTTATTGACCATTTTGACCACTCCCCCTATTGG	
3C9	(999)	CTTGGGGCTATACACCCCGCTTCTTATGCTATAGGTGATGGTATAGCTTAGCCTTAGGCTTAGGCTGGGTTATTGACCATTTTGACCACTCCCCCTATTGG	
4B5	(946)	CTTGGGGCTATACACCCCGCTTCTTATGCTATAGGTGATGGTATAGCTTAGCCTTAGGCTTAGGCTGGGTTATTGACCATTTTGACCACTCCCCCTATTGG	
6A8	(998)	CTTGGGGCTATACACCCCGCTTCTTATGCTATAGGTGATGGTATAGCTTAGCCTTAGGCTTAGGCTGGGTTATTGACCATTTTGACCACTCCCCCTATTGG	
6B2	(946)	CTTGGGGCTATACACCCCGCTTCTTATGCTATAGGTGATGGTATAGCTTAGCCTTAGGCTTAGGCTGGGTTATTGACCATTTTGACCACTCCCCCTATTGG	
6D4	(946)	CTTGGGGCTATACACCCCGCTTCTTATGCTATAGGTGATGGTATAGCTTAGCCTTAGGCTTAGGCTGGGTTATTGACCATTTTGACCACTCCCCCTATTGG	
6F6	(988)	CTTGGGGCTATACACCCCGCTTCTTATGCTATAGGTGATGGTATAGCTTAGCCTTAGGCTTAGGCTGGGTTATTGACCATTTTGACCACTCCCCCTATTGG	
9E1	(805)	CTTGGGGCTATACACCCCGCTTCTTATGCTATAGGTGATGGTATAGCTTAGCCTTAGGCTTAGGCTGGGTTATTGACCATTTTGACCACTCCCCCTATTGG	
9F11	(996)	CTTGGGGCTATACACCCCGCTTCTTATGCTATAGGTGATGGTATAGCTTAGCCTTAGGCTTAGGCTGGGTTATTGACCATTTTGACCACTCCCCCTATTGG	
9G11	(998)	CTTGGGGCTATACACCCCGCTTCTTATGCTATAGGTGATGGTATAGCTTAGCCTTAGGCTTAGGCTGGGTTATTGACCATTTTGACCACTCCCCCTATTGG	
9G12	(998)	CTTGGGGCTATACACCCCGCTTCTTATGCTATAGGTGATGGTATAGCTTAGCCTTAGGCTTAGGCTGGGTTATTGACCATTTTGACCACTCCCCCTATTGG	
9G4	(998)	CTTGGGGCTATACACCCCGCTTCTTATGCTATAGGTGATGGTATAGCTTAGCCTTAGGCTTAGGCTGGGTTATTGACCATTTTGACCACTCCCCCTATTGG	
9G7	(988)	CTTGGGGCTATACACCCCGCTTCTTATGCTATAGGTGATGGTATAGCTTAGCCTTAGGCTTAGGCTGGGTTATTGACCATTTTGACCACTCCCCCTATTGG	
9G8	(998)	CTTGGGGCTATACACCCCGCTTCTTATGCTATAGGTGATGGTATAGCTTAGCCTTAGGCTTAGGCTGGGTTATTGACCATTTTGACCACTCCCCCTATTGG	
AD169	(998)	CTTGGGGCTATACACCCCGCTTCTTATGCTATAGGTGATGGTATAGCTTAGCCTTAGGCTTAGGCTGGGTTATTGACCATTTTGACCACTCCCCCTATTGG	
Towne	(998)	CTTGGGGCTATACACCCCGCTTCTTATGCTATAGGTGATGGTATAGCTTAGCCTTAGGCTTAGGCTGGGTTATTGACCATTTTGACCACTCCCCCTATTGG	
Consensus	(1001)	CTTGGGGCTATACACCCCGCTTCTTATGCTATAGGTGATGGTATAGCTTAGCCTTAGGCTTAGGCTGGGTTATTGACCATTTTGACCACTCCCCCTATTGG	1101
10B2	(1098)	TGACGATACTTTCCATTACTAATCCATAACATGGCTCTTTGGCCACAACATATCTCTATTGGCTATATGCCAACTACTCTGTCTCTCAGAGACTGACACGGAC	
11E2	(1089)	TGACGATACTTTCCATTACTAATCCATAACATGGCTCTTTGGCCACAGCTATCTCTATTGGCTATATGCCAACTACTCTGTCTCTCAGAGACTGACACGGAC	
12C9	(898)	-----	
12E1	(1047)	TGACGATACTTTCCATTACTAATCCATAACATGGCTCTTTGGCCACAACATATCTCTATTGGCTATATGCCAACTACTCTGTCTCTCAGAGACTGACACGGAC	
12H9	(1098)	TGACGATACTTTCCATTACTAATCCATAACAGGGCTCTTTGGCCACAACATATCTCTATTGGCTATATGCCAACTACTCTGTCTCTCAGAGACTGACACGGAC	
3C9	(1099)	TGACGATACTTTCCATTACTAATCCATAACATGGCTCTTTGGCCACAACATATCTCTATTGGCTATATGCCAACTACTCTGTCTCTCAGAGACTGACACGGAC	
4B5	(1046)	TGACGATACTTTCCATTACTAATCCATAACATGGCTCTTTGGCCACAACATATCTCTATTGGCTATATGCCAACTACTCTGTCTCTCAGAGACTGACACGGAC	
6A8	(1098)	TGACGATACTTTCCATTACTAATCCATAACATGGCTCTTTGGCCACAACATATCTCTATTGGCTATATGCCAACTACTCTGTCTCTCAGAGACTGACACGGAC	
6B2	(1046)	TGACGATACTTTCCATTACTAATCCATAACATGGCTCTTTGGCCACAACATATCTCTATTGGCTATATGCCAACTACTCTGTCTCTCAGAGACTGACACGGAC	
6D4	(1046)	TGACGATACTTTCCATTACTAATCCATAACATGGCTCTTTGGCCACAACATATCTCTATTGGCTATATGCCAACTACTCTGTCTCTCAGAGACTGACACGGAC	
6F6	(1088)	TGACGATACTTTCCATTACTAATCCATAACATGGCTCTTTGGCCACAACATATCTCTATTGGCTATATGCCAACTACTCTGTCTCTCAGAGACTGACACGGAC	
9E1	(905)	TGACGATACTTTCCATTACTAATCCATAACATGGCTCTTTGGCCACAACATATCTCTATTGGCTATATGCCAACTACTCTGTCTCTCAGAGACTGACACGGAC	
9F11	(1096)	TGACGATACTTTCCATTACTAATCCATAACATGGCTCTTTGGCCACAACATATCTCTATTGGCTATATGCCAACTACTCTGTCTCTCAGAGACTGACACGGAC	
9G11	(1098)	TGACGATACTTTCCATTACTAATCCATAACATGGCTCTTTGGCCACAACATATCTCTATTGGCTATATGCCAACTACTCTGTCTCTCAGAGACTGACACGGAC	
9G12	(1098)	TGACGATACTTTCCATTACTAATCCATAACATGGCTCTTTGGCCACAACATATCTCTATTGGCTATATGCCAACTACTCTGTCTCTCAGAGACTGACACGGAC	
9G4	(1098)	TGACGATACTTTCCATTACTAATCCATAACATGGCTCTTTGGCCACAACATATCTCTATTGGCTATATGCCAACTACTCTGTCTCTCAGAGACTGACACGGAC	
9G7	(1088)	TGACGATACTTTCCATTACTAATCCATAACATGGCTCTTTGGCCACAACATATCTCTATTGGCTATATGCCAACTACTCTGTCTCTCAGAGACTGACACGGAC	
9G8	(1098)	TGACGATACTTTCCATTACTAATCCATAACATGGCTCTTTGGCCACAACATATCTCTATTGGCTATATGCCAACTACTCTGTCTCTCAGAGACTGACACGGAC	
AD169	(1098)	TGACGATACTTTCCATTACTAATCCATAACATGGCTCTTTGGCCACAACATATCTCTATTGGCTATATGCCAACTACTCTGTCTCTCAGAGACTGACACGGAC	
Towne	(1097)	TGACGATACTTTCCATTACTAATCCATAACATGGCTCTTTGGCCACAACATATCTCTATTGGCTATATGCCAACTACTCTGTCTCTCAGAGACTGACACGGAC	
Consensus	(1101)	TGACGATACTTTCCATTACTAATCCATAACATGGCTCTTTGGCCACAACATATCTCTATTGGCTATATGCCAACTACTCTGTCTCTCAGAGACTGACACGGAC	

Figure 8G: Comparison of 18 chimeric promoter sequences generated by DNA shuffling using CMV promoter nucleic acid sequences from AD169 and Towne human strains and Rhesus and Vervet monkey strains as parental sequences.

		1201		1300
10B2	(1198)	TCCTGATATTTTACAGGATGGGTCCCATTTATTTATTTTACAAATTCACATATACAAACACCGTCCCGTCCCGCAGTTTGTGTTAAACATAGCGTGG		
11E2	(1189)	TCCTGATATTTTACAGGATGGGTCTCATTTATTTATTTTACAAATTCACATATACAAACGCGTCCCGCTGCCCGAGTTTATTTAAACATAGCGTGG		
12C9	(898)	-----		
12E1	(1147)	TCCTGATATTTTACAGGATGGGTCCCATTTATTTATTTTACAAATTCACATATACAAACGCGTCCCGTCCCGCAGTTTGTGTTAAACATAGCGTGG		
12H9	(1198)	TCCTGATATTTTACAGGATGGGTCTCATTTATTTATTTTACAAATTCACATATACAAACGCGTCCCGCTGCCCGCAGTTTGTGTTAAACATAGCGTGG		
3C9	(1199)	TCCTGATATTTTACAGGATGGGTCCCATTTATTTATTTTACAAATTCACATATACAAACGCGTCCCGTCCCGCAGTTTGTGTTAAACATAGCGTGG		
4B5	(1146)	TCCTGATATTTTACAGGATGGGTCCCATTTATTTATTTTACAAATTCACATATACAAACGCGTCCCGTCCCGCAGTTTGTGTTAAACATAGCGTGG		
6A8	(1198)	TCCTGATATTTTACAGGATGGGTCCCATTTATTTATTTTACAAATTCACATATACAAACGCGTCCCGCTGCCCGCAGTTTGTGTTAAACATAGCGTGG		
6B2	(1146)	TCCTGATATTTTACAGGATGGGTCCCATTTATTTATTTTACAAATTCACATATACAAACGCGTCCCGTCCCGCAGTTTGTGTTAAACATAGCGTGG		
6D4	(1146)	TCCTGATATTTTACAGGATGGGTCCCATTTATTTATTTTACAAATTCACATATACAAACGCGTCCCGTCCCGCAGTTTGTGTTAAACATAGCGTGG		
6F6	(1188)	TCCTGATATTTTACAGGATGGGTCTCATTTATTTATTTTACAAATTCACATATACAAACGCGTCCCGCTGCCCGCAGTTTGTGTTAAACATAGCGTGG		
9E1	(1005)	TCCTGATATTTTACAGGATGGGTCCCATTTATTTATTTTACAAATTCACATATACAAACGCGTCCCGTCCCGCAGTTTGTGTTAAACATAGCGTGG		
9F11	(1196)	TCCTGATATTTTACAGGATGGGTCCCATTTATTTATTTTACAAATTCACATATACAAACGCGTCCCGCTGCCCGCAGTTTGTGTTAAACATAGCGTGG		
9G11	(1198)	TCCTGATATTTTACAGGATGGGTCCCATTTATTTATTTTACAAATTCACATATACAAACGCGTCCCGTCCCGCAGTTTGTGTTAAACATAGCGTGG		
9G12	(1198)	TCCTGATATTTTACAGGATGGGTCTCATTTATTTATTTTACAAATTCACATATACAAACGCGTCCCGCTGCCCGCAGTTTGTGTTAAACATAGCGTGG		
9G4	(1198)	TCCTGATATTTTACAGGATGGGTCTCATTTATTTATTTTACAAATTCACATATACAAACGCGTCCCGCTGCCCGCAGTTTGTGTTAAACATAGCGTGG		
9G7	(1188)	TCCTGATATTTTACAGGATGGGTCCCATTTATTTATTTTACAAATTCACATATACAAACGCGTCCCGTCCCGCAGTTTGTGTTAAACATAGCGTGG		
9G8	(1198)	TCCTGATATTTTACAGGATGGGTCCCATTTATTTATTTTACAAATTCACATATACAAACGCGTCCCGTCCCGCAGTTTGTGTTAAACATAGCGTGG		
AD169	(1198)	TCCTGATATTTTACAGGATGGGTCTCATTTATTTATTTTACAAATTCACATATACAAACGCGTCCCGTCCCGCAGTTTGTGTTAAACATAGCGTGG		
Towne	(1197)	TCCTGATATTTTACAGGATGGGTCCCATTTATTTATTTTACAAATTCACATATACAAACGCGTCCCGCTGCCCGCAGTTTGTGTTAAACATAGCGTGG		
Consensus	(1201)	TCCTGATATTTTACAGGATGGGTCCCATTTATTTATTTTACAAATTCACATATACAAACGCGTCCCGCTGCCCGCAGTTTGTGTTAAACATAGCGTGG		1400
		1301		
10B2	(1298)	GATCTCCACCGAAATCTCGGTACGTGTTCCGGTACGCGGAGCTTCCACATCCGAGCCCCGTGGTCCCATGCCCCAGCGGC		
11E2	(1289)	GATCTCCACCGAAATCTCGGTACGTGTTCCGGTACGCGGAGCTTCCACATCCGAGCCCCGTGGTCCCATGCCCCAGCGGC		
12C9	(898)	-----		
12E1	(1247)	GATCTCCACCGAAATCTCGGTACGTGTTCCGGTACGCGGAGCTTCCACATCCGAGCCCCGTGGTCCCATGCCCCAGCGGC		
12H9	(1298)	GATCTCCACCGAAATCTCGGTACGTGTTCCGGTACGCGGAGCTTCCACATCCGAGCCCCGTGGTCCCATGCCCCAGCGGC		
3C9	(1299)	GATCTCCACCGAAATCTCGGTACGTGTTCCGGTACGCGGAGCTTCCACATCCGAGCCCCGTGGTCCCATGCCCCAGCGGC		
4B5	(1246)	GATCTCCACCGAAATCTCGGTACGTGTTCCGGTACGCGGAGCTTCCACATCCGAGCCCCGTGGTCCCATGCCCCAGCGGC		
6A8	(1298)	GATCTCCACCGAAATCTCGGTACGTGTTCCGGTACGCGGAGCTTCCACATCCGAGCCCCGTGGTCCCATGCCCCAGCGGC		
6B2	(1246)	GATCTCCACCGAAATCTCGGTACGTGTTCCGGTACGCGGAGCTTCCACATCCGAGCCCCGTGGTCCCATGCCCCAGCGGC		
6D4	(1246)	GATCTCCACCGAAATCTCGGTACGTGTTCCGGTACGCGGAGCTTCCACATCCGAGCCCCGTGGTCCCATGCCCCAGCGGC		
6F6	(1288)	GATCTCCACCGAAATCTCGGTACGTGTTCCGGTACGCGGAGCTTCCACATCCGAGCCCCGTGGTCCCATGCCCCAGCGGC		
9E1	(1105)	GATCTCCACCGAAATCTCGGTACGTGTTCCGGTACGCGGAGCTTCCACATCCGAGCCCCGTGGTCCCATGCCCCAGCGGC		
9F11	(1296)	GATCTCCACCGAAATCTCGGTACGTGTTCCGGTACGCGGAGCTTCCACATCCGAGCCCCGTGGTCCCATGCCCCAGCGGC		
9G11	(1298)	GATCTCCACCGAAATCTCGGTACGTGTTCCGGTACGCGGAGCTTCCACATCCGAGCCCCGTGGTCCCATGCCCCAGCGGC		
9G12	(1298)	GATCTCCACCGAAATCTCGGTACGTGTTCCGGTACGCGGAGCTTCCACATCCGAGCCCCGTGGTCCCATGCCCCAGCGGC		
9G4	(1298)	GATCTCCACCGAAATCTCGGTACGTGTTCCGGTACGCGGAGCTTCCACATCCGAGCCCCGTGGTCCCATGCCCCAGCGGC		
9G7	(1288)	GATCTCCACCGAAATCTCGGTACGTGTTCCGGTACGCGGAGCTTCCACATCCGAGCCCCGTGGTCCCATGCCCCAGCGGC		
9G8	(1298)	GATCTCCACCGAAATCTCGGTACGTGTTCCGGTACGCGGAGCTTCCACATCCGAGCCCCGTGGTCCCATGCCCCAGCGGC		
AD169	(1298)	GATCTCCACCGAAATCTCGGTACGTGTTCCGGTACGCGGAGCTTCCACATCCGAGCCCCGTGGTCCCATGCCCCAGCGGC		
Towne	(1297)	GATCTCCACCGAAATCTCGGTACGTGTTCCGGTACGCGGAGCTTCCACATCCGAGCCCCGTGGTCCCATGCCCCAGCGGC		
Consensus	(1301)	GATCTCCACCGAAATCTCGGTACGTGTTCCGGTACGCGGAGCTTCCACATCCGAGCCCCGTGGTCCCATGCCCCAGCGGC		

Figure 8H: Comparison of 18 chimeric promoter sequences generated by DNA shuffling using CMV promoter nucleic acid sequences from AD169 and Towne human strains and Rhesus and Vervet monkey strains as parental sequences.

		1401			1500
10B2	(1398)	TCATGGTTCGCTCGGACGCTCCTTGCTCTTAAACAGTGGAGCCAGACTTAGGCACAGCACAATGCCACACACACAGTGTGCCGACAAGGCCGTGGCGG			
11E2	(1389)	TCATGGTTCGCTCGGACGCTCCTTGCTCTTAAACAGTGGAGCCAGACTTAGGCACAGCACAATGCCACACACACAGTGTGCCGACAAGGCCGTGGCGG			
12C9	(898)	-----			
12E1	(1347)	TCATGGTTCGCTCGGACGCTCCTTGCTCTTAAACAGTGGAGCCAGACTTAGGCACAGCACAATGCCACACACACAGTGTGCCGACAAGGCCGTGGCGG			
12H9	(1398)	TCATGGTTCGCTCGGACGCTCCTTGCTCTTAAACAGTGGAGCCAGACTTAGGCACAGCACAATGCCACACACACAGTGTGCCGACAAGGCCGTGGCGG			
3C9	(1399)	TCATGGTTCGCTCGGACGCTCCTTGCTCTTAAACAGTGGAGCCAGACTTAGGCACAGCACAATGCCACACACACAGTGTGCCGACAAGGCCGTGGCGG			
4B5	(1346)	TCATGGTTCGCTCGGACGCTCCTTGCTCTTAAACAGTGGAGCCAGACTTAGGCACAGCACAATGCCACACACACAGTGTGCCGACAAGGCCGTGGCGG			
6A8	(1398)	TCATGGTTCGCTCGGACGCTCCTTGCTCTTAAACAGTGGAGCCAGACTTAGGCACAGCACAATGCCACACACACAGTGTGCCGACAAGGCCGTGGCGG			
6B2	(1346)	TCATGGTTCGCTCGGACGCTCCTTGCTCTTAAACAGTGGAGCCAGACTTAGGCACAGCACAATGCCACACACACAGTGTGCCGACAAGGCCGTGGCGG			
6D4	(1346)	TCATGGTTCGCTCGGACGCTCCTTGCTCTTAAACAGTGGAGCCAGACTTAGGCACAGCACAATGCCACACACACAGTGTGCCGACAAGGCCGTGGCGG			
6F6	(1388)	TCATGGTTCGCTCGGACGCTCCTTGCTCTTAAACAGTGGAGCCAGACTTAGGCACAGCACAATGCCACACACACAGTGTGCCGACAAGGCCGTGGCGG			
9E1	(1205)	TCATGGTTCGCTCGGACGCTCCTTGCTCTTAAACAGTGGAGCCAGACTTAGGCACAGCACAATGCCACACACACAGTGTGCCGACAAGGCCGTGGCGG			
9F11	(1396)	TCATGGTTCGCTCGGACGCTCCTTGCTCTTAAACAGTGGAGCCAGACTTAGGCACAGCACAATGCCACACACACAGTGTGCCGACAAGGCCGTGGCGG			
9G11	(1398)	TCATGGTTCGCTCGGACGCTCCTTGCTCTTAAACAGTGGAGCCAGACTTAGGCACAGCACAATGCCACACACACAGTGTGCCGACAAGGCCGTGGCGG			
9G12	(1398)	TCATGGTTCGCTCGGACGCTCCTTGCTCTTAAACAGTGGAGCCAGACTTAGGCACAGCACAATGCCACACACACAGTGTGCCGACAAGGCCGTGGCGG			
9G4	(1398)	TCATGGTTCGCTCGGACGCTCCTTGCTCTTAAACAGTGGAGCCAGACTTAGGCACAGCACAATGCCACACACACAGTGTGCCGACAAGGCCGTGGCGG			
9G7	(1388)	TCATGGTTCGCTCGGACGCTCCTTGCTCTTAAACAGTGGAGCCAGACTTAGGCACAGCACAATGCCACACACACAGTGTGCCGACAAGGCCGTGGCGG			
9G8	(1398)	TCATGGTTCGCTCGGACGCTCCTTGCTCTTAAACAGTGGAGCCAGACTTAGGCACAGCACAATGCCACACACACAGTGTGCCGACAAGGCCGTGGCGG			
AD169	(1398)	TCATGGTTCGCTCGGACGCTCCTTGCTCTTAAACAGTGGAGCCAGACTTAGGCACAGCACAATGCCACACACACAGTGTGCCGACAAGGCCGTGGCGG			
Towne	(1397)	TCATGGTTCGCTCGGACGCTCCTTGCTCTTAAACAGTGGAGCCAGACTTAGGCACAGCACAATGCCACACACACAGTGTGCCGACAAGGCCGTGGCGG			
Consensus	(1401)	TCATGGTTCGCTCGGACGCTCCTTGCTCTTAAACAGTGGAGCCAGACTTAGGCACAGCACAATGCCACACACACAGTGTGCCGACAAGGCCGTGGCGG			1501
10B2	(1498)	TAGGGTATGTGTCGAAAAATGAGCTCGGAGATTGGGCTCGCACCCGCTGACGACAGATGGAAGACTTAAGGCAGCGGCAGAAAGATGCGAGGCAGCTGAGT			
11E2	(1489)	TAGGGTATGTGTCGAAAAATGAGCTCGGAGCTTGGGCTCGCACCCGCTGACGACAGATGGAAGACTTAAGGCAGCGGCAGAAAGATGCGAGGCAGCTGAGT			
12C9	(898)	-----			
12E1	(1447)	TAGGGTATGTGTCGAAAAATGAGCTCGGAGATTGGGCTCGCACCCGCTGACGACAGATGGAAGACTTAAGGCAGCGGCAGAAAGATGCGAGGCAGCTGAGT			
12H9	(1498)	TAGGGTATGTGTCGAAAAATGAGCTCGGGAGCGGGCTTGACCCGCTGACGACAGATGGAAGACTTAAGGCAGCGGCAGAAAGATGCGAGGCAGCTGAGT			
3C9	(1499)	TAGGGTATGTGTCGAAAAATGAGCTCGGCTCGG--AGTGGGCTTGACCCGCTGACGACATTTGGAAGACTTAAGGCAGCGGCAGAAAGATGCGAGGCAGCTGAGT			
4B5	(1446)	TAGGGTATGTGTCGAAAAATGAGCTCGGAGATTGGGCTCGCACCCGCTGACGACAGATGGAAGACTTAAGGCAGCGGCAGAAAGATGCGAGGCAGCTGAGT			
6A8	(1498)	TAGGGTATGTGTCGAAAAATGAGCTCGGAGATCGGGCTCGCACCCGCTGACGACAGATGGAAGACTTAAGGCAGCGGCAGAAAGATGCGAGGCAGCTGAGT			
6B2	(1446)	TAGGGTATGTGTCGAAAAATGAGCTCGGAGATTGGGCTCGCACCCGCTGACGACAGATGGAAGACTTAAGGCAGCGGCAGAGGAAGATGCGAGGCAGCTGAGT			
6D4	(1446)	TAGGGTATGTGTCGAAAAATGAGCTCGGAGATTGGGCTCGCACCCGCTGACGACAGATGGAAGACTTAAGGCAGCGGCAGAGGAAGATGCGAGGCAGCTGAGT			
6F6	(1488)	TAGGGTATGTGTCGAAAAATGAGCTCGGAGATTGGGCTCGCACCCGCTGACGACAGATGGAAGACTTAAGGCAGCGGCAGAAAGATGCGAGGCAGCTGAGT			
9E1	(1305)	TAGGGTATGTGTCGAAAAATGAGCTCGGAGATTGGGCTCGCACCCGCTGACGACAGATGGAAGACTTAAGGCAGCGGCAGAAAGATGCGAGGCAGCTGAGT			
9F11	(1496)	TAGGGTATGTGTCGAAAAATGAGCTCGGAGATTGGGCTCGCACCCGCTGACGACAGATGGAAGACTTAAGGCAGCGGCAGAAAGATGCGAGGCAGCTGAGT			
9G11	(1498)	TAGGGTATGTGTCGAAAAATGAGCTCGGAGATTGGGCTCGCACCCGCTGACGACAGATGGAAGACTTAAGGCAGCGGCAGAAAGATGCGAGGCAGCTGAGT			
9G12	(1498)	TAGGGTATGTGTCGAAAAATGAGCTCGGGAGCGGGCTTGACCCGCTGACGACAGATGGAAGACTTAAGGCAGCGGCAGAAAGATGCGAGGCAGCTGAGT			
9G4	(1498)	TAGGGTATGTGTCGAAAAATGAGCTCGGAGATTGGGCTCGCACCCGCTGACGACAGATGGAAGACTTAAGGCAGCGGCAGAAAGATGCGAGGCAGCTGAGT			
9G7	(1488)	TAGGGTATGTGTCGAAAAATGAGCTCGGAGATTGGGCTCGCACCCGCTGACGACAGATGGAAGACTTAAGGCAGCGGCAGAAAGATGCGAGGCAGCTGAGT			
9G8	(1498)	TAGGGTATGTGTCGAAAAATGAGCTCGGAGATTGGGCTCGCACCCGCTGACGACAGATGGAAGACTTAAGGCAGCGGCAGAAAGATGCGAGGCAGCTGAGT			
AD169	(1498)	TAGGGTATGTGTCGAAAAATGAGCTCGGGAGCGGGCTTGACCCGCTGACGACAGATGGAAGACTTAAGGCAGCGGCAGAAAGATGCGAGGCAGCTGAGT			
Towne	(1497)	TAGGGTATGTGTCGAAAAATGAGCTCGGAGATTGGGCTCGCACCG--TGACGACAGATGGAAGACTTAAGGCAGCGGCAGAAAGATGCGAGGCAGCTGAGT			
Consensus	(1501)	TAGGGTATGTGTCGAAAAATGAGCTCGGAGATTGGGCTCGCACCCGCTGACGACAGATGGAAGACTTAAGGCAGCGGCAGAAAGATGCGAGGCAGCTGAGT			

Figure 8I: Comparison of 18 chimeric promoter sequences generated by DNA shuffling using CMV promoter nucleic acid sequences from AD169 and Towne human strains and Rhesus and Vervet monkey strains as parental sequences.

		1601	1700
10B2	(1598)	TGTTGTAATCTGATAAAGAGTCAGAGGTAAC	TCCCGTTGCGGGTGTGTTAAACGGTGGAGGGCAGTGTAGTCTGAGCAGTACTCGTTGCTGCCGGCGCGGCC
11E2	(1589)	TGTTGTAATCTGATAAAGAGTCAGAGGTAAC	TCCCGTTGCGGGTGTGTTAAACGGTGGAGGGCAGTGTAGTCTGAGCAGTACTCGTTGCTGCCGGCGCGGCC
12C9	(898)	-----	-----
12E1	(1547)	TGTTGTAATCTGATAAAGAGTCAGAGGTAAC	TCCCGTTGCGGGTGTGTTAAACGGTGGAGGGCAGTGTAGTCTGAGCAGTACTCGTTGCTGCCGGCGCGGCC
12H9	(1598)	TGTTGTAATCTGATAAAGAGTCAGAGGTAAC	TCCCGTTGCGGGTGTGTTAAACGGTGGAGGGCAGTGTAGTCTGAGCAGTACTCGTTGCTGCCGGCGCGGCC
3C9	(1597)	TGTTGTTGTTCTGATAAAGAGTCAGAGGTAAC	TCCCGTTGCGGGTGTGTTAAACGGTGGAGGGCAGTGTAGTCTGAGCAGTACTCGTTGCTGCCGGCGCGGCC
4B5	(1546)	TGTTGTAATCTGATAAAGAGTCAGAGGTAAC	TCCCGTTGCGGGTGTGTTAAACGGTGGAGGGCAGTGTAGTCTGAGCAGTACTCGTTGCTGCCGGCGCGGCC
6A8	(1598)	TGTTGTTGTTCTGATAAAGAGTCAGAGGTAAC	TCCCGTTGCGGGTGTGTTAAACGGTGGAGGGCAGTGTAGTCTGAGCAGTACTCGTTGCTGCCGGCGCGGCC
6B2	(1546)	TGTTGTTGTTCTGATAAAGAGTCAGAGGTAAC	TCCCGTTGCGGGTGTGTTAAACGGTGGAGGGCAGTGTAGTCTGAGCAGTACTCGTTGCTGCCGGCGCGGCC
6D4	(1598)	TGTTGTAATCTGATAAAGAGTCAGAGGTAAC	TCCCGTTGCGGGTGTGTTAAACGGTGGAGGGCAGTGTAGTCTGAGCAGTACTCGTTGCTGCCGGCGCGGCC
6F6	(1588)	TGTTGTAATCTGATAAAGAGTCAGAGGTAAC	TCCCGTTGCGGGTGTGTTAAACGGTGGAGGGCAGTGTAGTCTGAGCAGTACTCGTTGCTGCCGGCGCGGCC
9E1	(1405)	TGTTGTAATCTGATAAAGAGTCAGAGGTAAC	TCCCGTTGCGGGTGTGTTAAACGGTGGAGGGCAGTGTAGTCTGAGCAGTACTCGTTGCTGCCGGCGCGGCC
9F11	(1596)	TGTTGTAATCTGATAAAGAGTCAGAGGTAAC	TCCCGTTGCGGGTGTGTTAAACGGTGGAGGGCAGTGTAGTCTGAGCAGTACTCGTTGCTGCCGGCGCGGCC
9G11	(1598)	TGTTGTAATCTGATAAAGAGTCAGAGGTAAC	TCCCGTTGCGGGTGTGTTAAACGGTGGAGGGCAGTGTAGTCTGAGCAGTACTCGTTGCTGCCGGCGCGGCC
9G12	(1598)	TGTTGTAATCTGATAAAGAGTCAGAGGTAAC	TCCCGTTGCGGGTGTGTTAAACGGTGGAGGGCAGTGTAGTCTGAGCAGTACTCGTTGCTGCCGGCGCGGCC
9G4	(1598)	TGTTGTAATCTGATAAAGAGTCAGAGGTAAC	TCCCGTTGCGGGTGTGTTAAACGGTGGAGGGCAGTGTAGTCTGAGCAGTACTCGTTGCTGCCGGCGCGGCC
9G7	(1588)	TGTTGTAATCTGATAAAGAGTCAGAGGTAAC	TCCCGTTGCGGGTGTGTTAAACGGTGGAGGGCAGTGTAGTCTGAGCAGTACTCGTTGCTGCCGGCGCGGCC
9G8	(1598)	TGTTGTAATCTGATAAAGAGTCAGAGGTAAC	TCCCGTTGCGGGTGTGTTAAACGGTGGAGGGCAGTGTAGTCTGAGCAGTACTCGTTGCTGCCGGCGCGGCC
AD169		TGTTGTTGTTCTGATAAAGAGTCAGAGGTAAC	TCCCGTTGCGGGTGTGTTAAACGGTGGAGGGCAGTGTAGTCTGAGCAGTACTCGTTGCTGCCGGCGCGGCC
Towne		TGTTGTAATCTGATAAAGAGTCAGAGGTAAC	TCCCGTTGCGGGTGTGTTAAACGGTGGAGGGCAGTGTAGTCTGAGCAGTACTCGTTGCTGCCGGCGCGGCC
Consensus	(1601)	TGTTGTAATCTGATAAAGAGTCAGAGGTAAC	TCCCGTTGCGGGTGTGTTAAACGGTGGAGGGCAGTGTAGTCTGAGCAGTACTCGTTGCTGCCGGCGCGGCC
		1701	1770
10B2	(1698)	ACCAGACATAATAGCTGACAGACTAACAGACT	GTTCCTTCCATGGGTCCTTTCTCGCAGTCACCGTCCCTT
11E2	(1689)	ACCAGACATAAATAGCTGACAGACTAACAGACT	GTTCCTTCCATGGGTCCTTTCTCGCAGTCACCGTCCCTT
12C9	(898)	-----	-----
12E1	(1647)	ACCAGACATAATAGCTGACAGACTAACAGACT	GTTCCTTCCATGGGTCCTTTCTCGCAGTCACCGTCCCTT
12H9	(1698)	ACCAGACATAAATAGCTGACAGACTAACAGACT	GTTCCTTCCATGGGTCCTTTCTCGCAGTCACCGTCCCTT
3C9	(1697)	ACCAGACATAATAGCTGACAGACTAACAGACT	GTTCCTTCCATGGGTCCTTTCTCGCAGTCACCGTCCCTT
4B5	(1646)	ACCAGACATAAATAGCTGACAGACTAACAGACT	GTTCCTTCCATGGGTCCTTTCTCGCAGTCACCGTCCCTT
6A8	(1698)	ACCAGACATAATAGCTGACAGACTAACAGACT	GTTCCTTCCATGGGTCCTTTCTCGCAGTCACCGTCCCTT
6B2	(1646)	ACCAGACATAAATAGCTGACAGACTAACAGACT	GTTCCTTCCATGGGTCCTTTCTCGCAGTCACCGTCCCTT
6D4	(1646)	ACCAGACATAAATAGCTGACAGACTAACAGACT	GTTCCTTCCATGGGTCCTTTCTCGCAGTCACCGTCCCTT
6F6	(1688)	ACCAGACATAAATAGCTGACAGACTAACAGACT	GTTCCTTCCATGGGTCCTTTCTCGCAGTCACCGTCCCTT
9E1	(1505)	ACCAGACATAAATAGCTGACAGACTAACAGACT	GTTCCTTCCATGGGTCCTTTCTCGCAGTCACCGTCCCTT
9F11	(1696)	ACCAGACATAAATAGCTGACAGACTAACAGACT	GTTCCTTCCATGGGTCCTTTCTCGCAGTCACCGTCCCTT
9G11	(1698)	ACCAGACATAAATAGCTGACAGACTAACAGACT	GTTCCTTCCATGGGTCCTTTCTCGCAGTCACCGTCCCTT
9G12	(1698)	ACCAGACATAAATAGCTGACAGACTAACAGACT	GTTCCTTCCATGGGTCCTTTCTCGCAGTCACCGTCCCTT
9G4	(1698)	ACCAGACATAAATAGCTGACAGACTAACAGACT	GTTCCTTCCATGGGTCCTTTCTCGCAGTCACCGTCCCTT
9G7	(1688)	ACCAGACATAAATAGCTGACAGACTAACAGACT	GTTCCTTCCATGGGTCCTTTCTCGCAGTCACCGTCCCTT
9G8	(1698)	ACCAGACATAAATAGCTGACAGACTAACAGACT	GTTCCTTCCATGGGTCCTTTCTCGCAGTCACCGTCCCTT
AD169		ACCAGACATAAATAGCTGACAGACTAACAGACT	GTTCCTTCCATGGGTCCTTTCTCGCAGTCACCGTCCCTT
Towne		ACCAGACATAAATAGCTGACAGACTAACAGACT	GTTCCTTCCATGGGTCCTTTCTCGCAGTCACCGTCCCTT
Consensus	(1701)	ACCAGACATAAATAGCTGACAGACTAACAGACT	GTTCCTTCCATGGGTCCTTTCTCGCAGTCACCGTCCCTT

FIGURE 9

Vector for promoter evolution

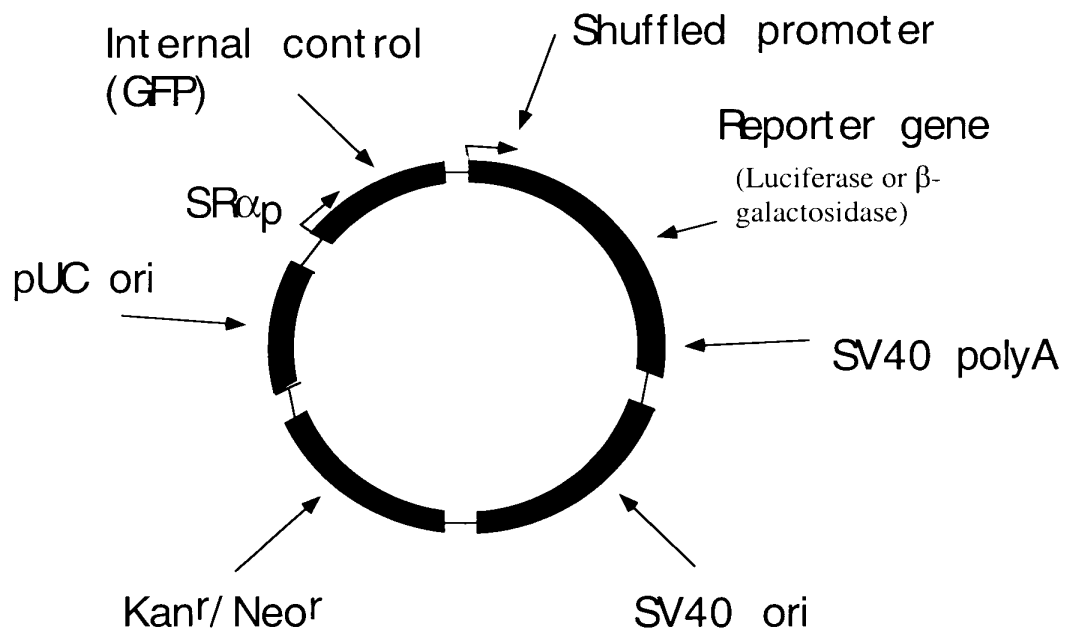


FIGURE 10A

Towne_promoter_fr_PCR_prod_seq	1	60
Rhesus_monkey_PCR_prod_821bp		
Vervet_(Simian)_PCR_product_seq		
Towne_promoter_fr_PCR_prod_seq	61	120
Rhesus_monkey_PCR_prod_821bp		
Vervet_(Simian)_PCR_product_seq		
Towne_promoter_fr_PCR_prod_seq	121	180
Rhesus_monkey_PCR_prod_821bp		
Vervet_(Simian)_PCR_product_seq		
Towne_promoter_fr_PCR_prod_seq	181	240
Rhesus_monkey_PCR_prod_821bp		
Vervet_(Simian)_PCR_product_seq		

FIGURE 10B

Towne_promoter_fr_PCR_prod_seq	241	300
Rhesus_monkey_PCR_prod_821bp		
Vervet_(Simian)_PCR_product_seq		
<p>TAATAGTA.....ATCAATTACGGGGTCATTAGTTCATAGCCCATATATGGAGTTCGCGC AGGCAATA.....ATCCCATATTGG...CATATGTCCCATATTGCGCTATAGCCCATATTGGC GGGCGGTCCCATATACCATATATGG...GGCTTCCTAATACCGCCCATAGCCACTCCCCC</p>		
Towne_promoter_fr_PCR_prod_seq	301	360
Rhesus_monkey_PCR_prod_821bp		
Vervet_(Simian)_PCR_product_seq		
<p>GT...T..ACATAACTTACGGTAAATGGCCCGCCTCGTGACCGCCCAACGACCCCGCGCCC TTATGT..CCATTACCAATACCATATATATGGGTCTTCCTATATACGTCATAGGTACCGCCCC AT...TGACGTCAATGGTCTCTATATATATGGTCTTTCTCTATTGACGTCATATGGGCGGTCC</p>		
Towne_promoter_fr_PCR_prod_seq	361	420
Rhesus_monkey_PCR_prod_821bp		
Vervet_(Simian)_PCR_product_seq		
<p>.ATTGACGT.....CAA .ATTGACGTAATATGGATACGCCCTCCATTGACGTCAATGGGAGGGATTAAATATACGTCAC TATTGACGTA.TATGGCGCCTCCCCCATTTGACGTCAATTACGGTAAATGGCCCGCCTGGC</p>		
Towne_promoter_fr_PCR_prod_seq	421	480
Rhesus_monkey_PCR_prod_821bp		
Vervet_(Simian)_PCR_product_seq		
<p>TAATGACGTATGTTCCCAT.....AGTAACGCCAATAGGG..ACTTTCCA TAATACCGCCCATTTGACGTGTATAGGACCGTCCCATTTGACGTCAATAGGCCACCTCCCA T..CAATGCCCATTGACGT.....CAATAGGACCACCCACCA</p>		

FIGURE 10C

Towne_promoter_fr_PCR_prod_seq	481	540
Rhesus_monkey_PCR_prod_821bp		
Vervet_(Simian)_PCR_product_seq		
<p>TTGACGTCAATGGGTGGAGTATTACGGTAAACTGCCCCACTT.....GGCAGTAC TTGACGTCAATGGG.....GTGGCCCATTTGCCCATTC..... TTGACGTCAATGGG.....ATGGCTCATTTGCCCATTCATATATCCGTTT.....</p>		
Towne_promoter_fr_PCR_prod_seq	541	600
Rhesus_monkey_PCR_prod_821bp		
Vervet_(Simian)_PCR_product_seq		
<p>ATCAAGTGTATCATATGCCAAGTCCTGGCCCCCTATTGACGTCAATGACGGTAAATGGCCC CCACGCCCCCTATTGACGTCAATGACGGTAAATGGCC. TCACGCCCCCTATTGACGTCAATGACGGTAAATGGCC.</p>		
Towne_promoter_fr_PCR_prod_seq	601	660
Rhesus_monkey_PCR_prod_821bp		
Vervet_(Simian)_PCR_product_seq		
<p>GCC'TGGCATTATGCCCAGTACATGACCTTACGGGACTTTCCTACTTGGCAGTACATC..T CACTTGGCAGTACATCAAT CACTTGGCAGTACATCAAT</p>		
Towne_promoter_fr_PCR_prod_seq	661	720
Rhesus_monkey_PCR_prod_821bp		
Vervet_(Simian)_PCR_product_seq		
<p>ACGTATTAGTCATCGCTATTACCATGGTGATGCGGTTTGGCAGTACACCAA..... ACCTATTAAATAGTAACT..TGGCAAGTAAATGGGTACTTGGCAGTACACCAAGG.TACAT ATCTATTAAATAGTAACT..TGGCAAGTACATTAATTTGGCAAGTACGCCAAGGGTACAT</p>		

FIGURE 10D

Towne_promoter_fr_PCR_prod_seq	721	780
Rhesus_monkey_PCR_prod_821bp		
Vervet_(Simian)_PCR_product_seq		
<p>.....TGGGCGTGATAGCGGT...TTGACTCACGGGGATTTCCAAGTCTC TGGCAG.TACTCCCATTGACGTCAATGGCGGTAAATGGCCCCGCAATGGCTGCCCAAGTACA TGGCAGGTACTCTCCCATTGACGTCAATGGCGGTAAATGGCCCCGGCATGGCTGCCCAAGTACA</p>		
Towne_promoter_fr_PCR_prod_seq	781	840
Rhesus_monkey_PCR_prod_821bp		
Vervet_(Simian)_PCR_product_seq		
<p>...CACCCCATTGACGTCAATGGGAGTTGTTTTGGCACCAAAATCAACGGGACTTTCCA ...TGCCC.ATTGACGTCAATGGGG..... ACATCCCC.ATTGACGTCAATGGGAA.....</p>		
Towne_promoter_fr_PCR_prod_seq	841	900
Rhesus_monkey_PCR_prod_821bp		
Vervet_(Simian)_PCR_product_seq		
<p>AAATGTCGTAATAACCCCGCCCGTTGACGCAAAATGGGCG..... CGGTCCCTATGACGTCAATGGGCG..... GGGGCAATGACGCAAAATGGGCGTTCCATTGACGTAAATGGCG</p>		
Towne_promoter_fr_PCR_prod_seq	901	960
Rhesus_monkey_PCR_prod_821bp		
Vervet_(Simian)_PCR_product_seq		
<p>GTAGGCGGTACGGTGGGAGGTCTATATAAGCAGAGCTCGTTTAGTGAACCGTCAGATCG GTAGGCGGTGC.CTATGGGCGGTCTATATAAGCAATGCACGTTTAGGGAACCGCCATTCTG GTAGGCGTGCCTAATGGGAGGTCTATATAAGCAATGCTCGTTTAGGGAACCGCCATTCTG</p>		

FIGURE 10E

Towne_promoter_fr_PCR_prod_seq	961	CCTGGAGACGCCATCCACGCTGTTTGACCTCCAT.AGAAGACACCGGG.ACCGATCCAG	1020
Rhesus_monkey_PCR_prod_821bp		CCTGGGACGTCG.....GAGGAGCACCAT.AGAAGGTACCGGGGACCGATCCAG	
Vervet_(Simian)_PCR_product_seq		CCTGGGACGTCG.....GAGGAGCTCCATTGGAAGAGACCGGG.ACCGATCCAG	
Towne_promoter_fr_PCR_prod_seq	1021	CCTCCGGCGCCGGGAACGGTGCATTGGAACGCGGATT	SEQ ID NO:20
Rhesus_monkey_PCR_prod_821bp		CCTCCATAGCCGGGAAGGGTGCATTGGAACGCGGATA	SEQ ID NO:22
Vervet_(Simian)_PCR_product_seq		CCTCCATAGCCGGGACGGTGCATTGGAATGCGGATA	SEQ ID NO:23